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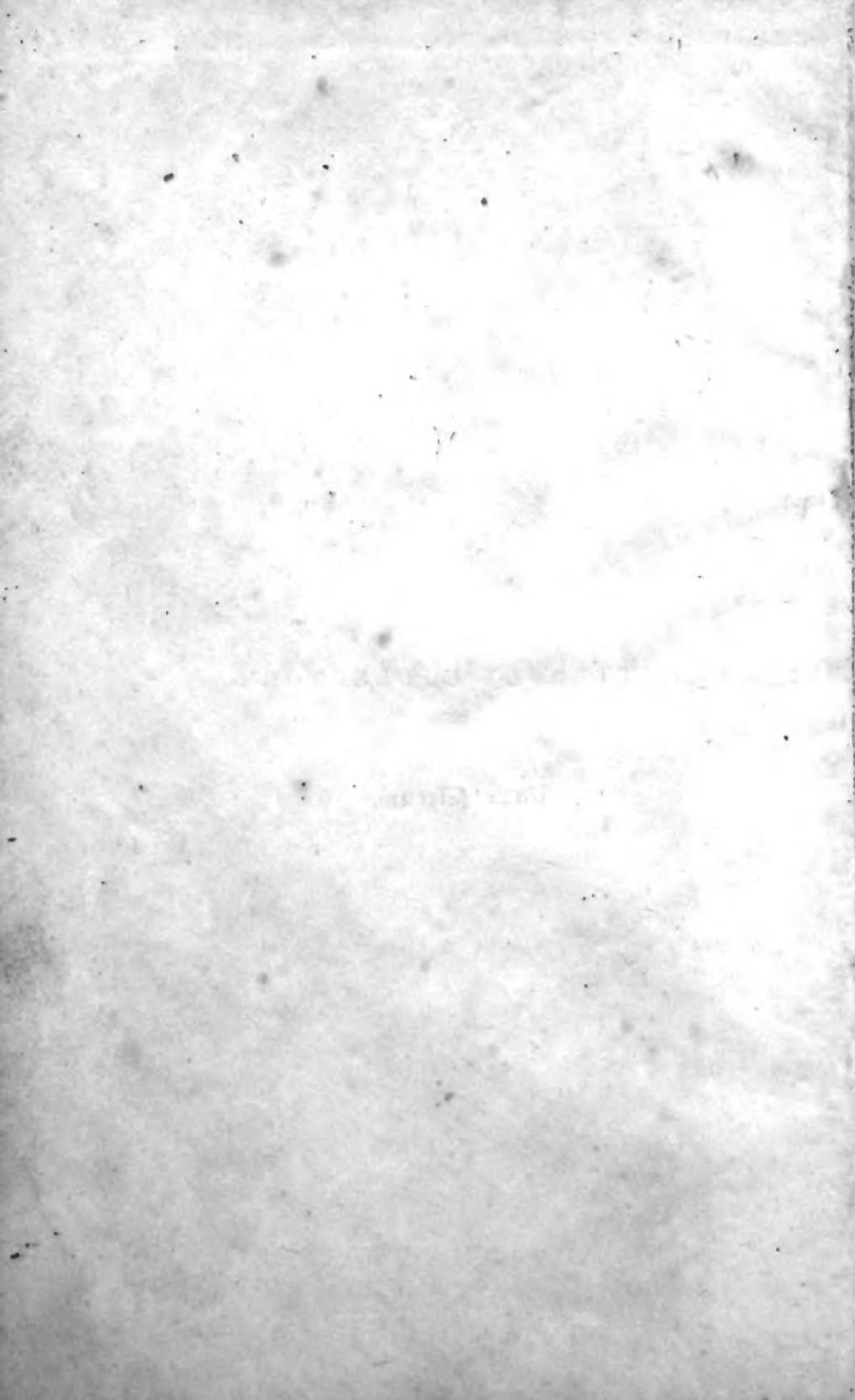
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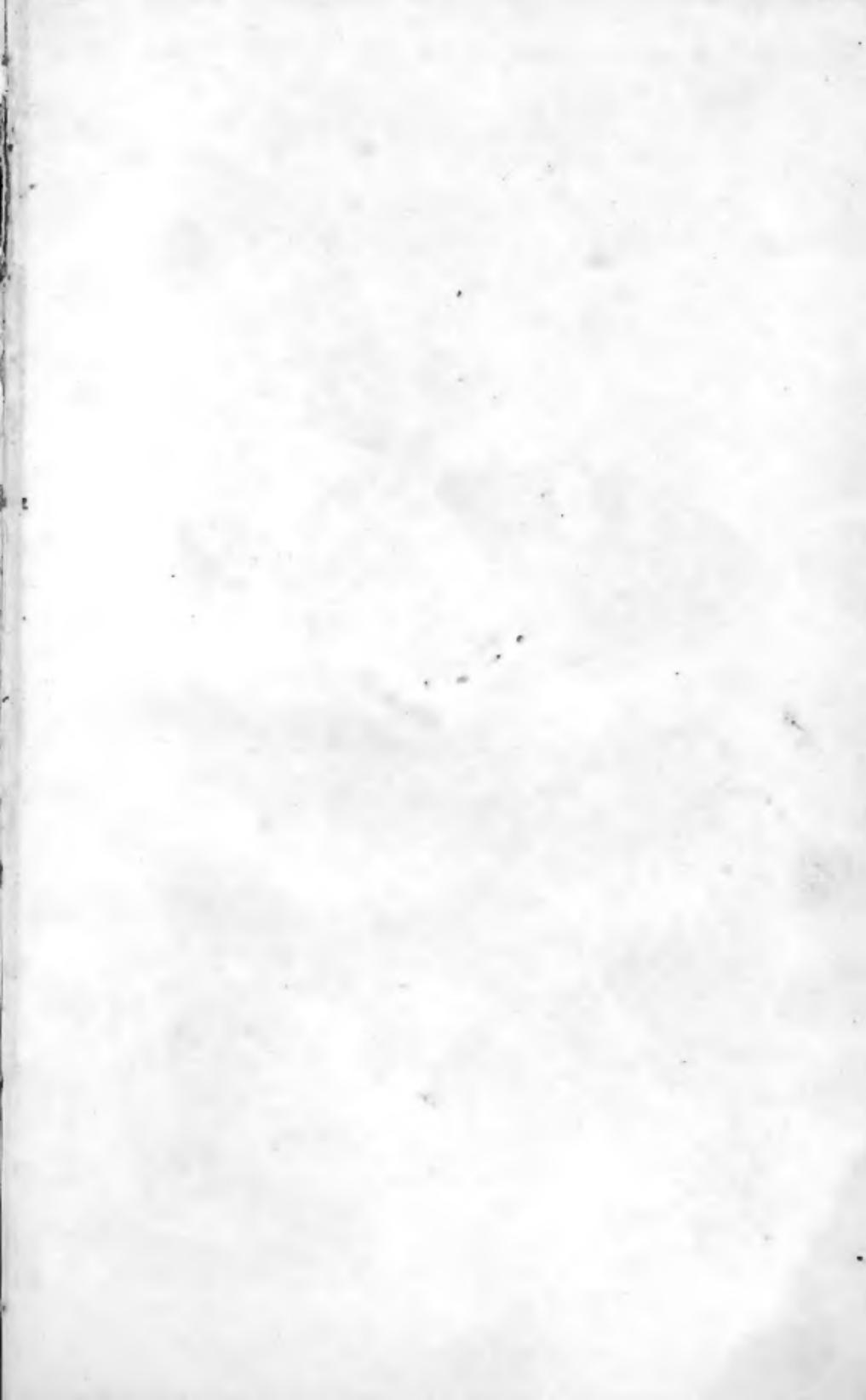
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THE  
BUTTERFLY COLLECTOR'S

Vade Mecum.







*Lacistema* (Linnæus) delineata

THE  
BUTTERFLY COLLECTOR'S  
Vade Mecum;  
WITH A SYNOPTICAL TABLE  
OF  
BRITISH BUTTERFLIES.

"NOMINA SI NESCIS, PERIT ET COGNITIO RERUM."

Third Edition.

LONDON:  
LONGMAN AND CO.; WHITTAKER AND CO.;  
AND F. PAWSEY, IPSWICH.

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PRINTED BY F. PAWSEY, OLD BUTTER MARKET.

TO THE  
REV. WILLIAM KIRBY, A.M.  
F. R. S. AND F. L. S.  
RECTOR OF BARIHAM, IN SUFFOLK,  
WHOSE  
ARDENT AND UNREMITTING ZEAL IN THE STUDY OF  
ENTOMOLOGY,  
AND WHOSE VALUABLE AND JUDICIOUS LABOURS  
IN THAT SCIENCE,  
DEMAND THE GRATEFUL ACKNOWLEDGMENT OF EVERY TRUE  
FRIEND AND ADMIRER OF  
NATURAL HISTORY;  
THE FOLLOWING  
ACCOUNT OF BRITISH BUTTERFLIES,  
ENRICHED  
BY HIS ACCURATE AND VALUABLE REMARKS,  
IS RESPECTFULLY INSCRIBED.



## ADVERTISEMENT.

*Encouraged by the very favorable reception of "The Butterfly Collector's Jade Mecum," the author has been induced to venture on a third, and much enlarged edition, and to exert her best endeavours to render it still more useful and deserving of notice.*

*The prefatory matter has, with permission of the authors of "The Introduction to Entomology," been enriched by the accession of many interesting and appropriate remarks from that elaborate and valuable work.*

*The "Directions for Collecting and Preserving Butterflies," have been much extended and improved; their haunts, habits, and times of appearance, together with the instruments employed in their capture, more fully described; and the terms, explanatory of the anatomy of the Butterfly, adapted to the new system.*

*The "Synoptical Table" has not only been augmented, but re-modelled and arranged according to the new Genera; and to*

*Facilitate the acquirement of this pleasing study, three plates, containing a figure of the wings of each Genus, have been added.*

*The author's anxiety to present to the public a complete description of every British Butterfly, Caterpillar, and Chrysalis, has, from the extreme difficulty of obtaining that desideratum, occasioned unavoidable delay: in this department, however, she has been most materially assisted by the kindness of the Rev. William Kirby, whose knowledge of Entomology is equalled only by his liberality in imparting it. From Ochsenheimer's elaborate work (*Schmetterlinge von Europa*) he has added the descriptions of many Caterpillars and Chrysalies to those in Haworth. To him also she is particularly indebted for the descriptions of many of the rarer Butterflies, which his superior information and a reference to the works of foreign authors in his valuable library, enabled him to supply. For all his judicious corrections and for his superintendence of this little work, she begs to offer her grateful and sincere acknowledgments.*

## P R E F A C E.

FROM the many additions which have been made by scientific Entomologists to the list of British Butterflies, since the publication of the "Aurelian's Pocket Companion," by Harris, in 1775, as well as from the circumstance of that work having long been out of print, and therefore difficult to be procured; it is presumed that the admirers of this pleasing branch of Natural History, will be interested in the appearance of a "Vade Mecum," which is partly extracted from "Haworth's Lepidoptera," a work of great merit, but which is now not easily obtained.

It is a frequent subject of complaint, that most of our Vade Mecums, or Introductions to particular Branches of Knowledge, are of a too general or of too scientific a cast. Those of the former, being often designed only for the amusement of children, or having no higher aim than the gratification of the mere general reader, cannot fail to disappoint the expectations which they tend to excite; while those of the latter, usually dry and technical, possess but few attractions, and are consequently thrown aside by

the student, who is deterred from further pursuit by the forbidding aspect under which the subject is presented to his notice.

It has therefore been the object of the Editor of the present little work to avoid both these extremes, and thus blending amusement with scientific instruction, to offer to the collector of British Butterflies an acceptable guide. That it might have been much more complete, she readily admits; and, under abler hands, she is not ashamed to confess, that it is yet capable of further improvement.

— “ Still an ample field remains,  
But not for her, to others she gives way,  
Who choose a longer course.” \*

But it is not the province of authors to point out their own defects. It is submitted, therefore, such as it is, to the kind indulgence of the British Aurelianist, with requesting his attention to the following remark :—

In the Synoptical Table, are inserted the names of those Butterflies *only*, which are recorded as *purely British* on

\* It is a source of gratification to the author of this little work, that it appears to have led to the publication of “ Brown's Book of Butterflies,” and to the elegant volume on the same subject in the “ Naturalist's Library,” by Duncan; to whom it seems to have been in no slight degree useful.

unquestionable authority ; except in a few instances, where they are marked as doubtful.

The natural history of animals is the most interesting to man as an animated being, and the most striking and prominent in the phenomena which it displays. And although the study of every class is most indisputably attended with peculiar advantages ; yet it may safely be affirmed, that it is from the knowledge of the characters, metamorphoses, and various modes of life which insects are destined to pursue, that a more intimate acquaintance may be obtained with the laws of nature, and veneration for the great Creator of all, than can be derived from the contemplation of any other class in the animated world. Whilst most animals retain during life the form which they receive at their birth, insects are distinguished by the wonderful changes they undergo. Their existence partakes of two, three, and four distinct states ; and, in each of these, differs most essentially in appearance, organization, and manner of living. It is in this class of animals also, above all others, that we are struck with what Cicero has called “the *insatiable* variety of nature.”

Entomology, or the science of insects, has of late years, therefore, become a favourite pursuit ; and the talent and research displayed in the elucidation of it by a Kirby and

a Spence,\* combined with the moral and religious instruction which their writings universally convey, cannot fail of increasing the number of its votaries, and thereby opening "a mine of pleasure new, boundless and inexhaustible."

An objection, however, has been often urged against the followers of this interesting pursuit: an objection, which is indeed calculated to make a deep impression upon every tender mind—and that is, the charge of inhumanity. But this I think is easily obviated. "They who see no cruelty in the sports of the field, as they are called," observe the authors of the *Introduction to Entomology*, "can never, of course, consistently allege such a charge against the Aurelianist; the torture of wounded birds, of fish that swallow the hook and break the line, or of the hunted hare, being beyond comparison greater than those of insects destroyed in the usual mode.

But even in the views of those few who think inhumanity chargeable upon the sportsman, it will be easy to place considerations which may rescue the Entomologist from such reproof.

It is an admitted hypothesis, that in proportion as we

\* *Introduction to Entomology, or Elements of the Natural History of Insects, with plates, 4 vols. 8vo.*

descend in the scale of being, the sensibility of the objects that constitute it diminishes. This, indeed, might be inferred *a priori*, since providence seems to have been more prodigal of insect life than of that of any other order of creatures—animalcula, perhaps, alone excepted. But this inference is reduced to certainty, when we attend to the facts which insects every day present to us, proving that the very converse of our great poet's conclusion,

—————“the poor beetle that we tread upon  
In corporal sufferance feels a pang as great  
As when a giant dics.”

must be regarded as nearer the truth.”\*

The vulgar think, and those who think themselves wiser than the vulgar make no scruple to say, let him who has nothing to do employ himself in hunting after Butterflies. Those who thus deride an apparently trifling pursuit, would do well to remember that studies which, upon a superficial view, seem to be useless, may ultimately prove of no small importance to mankind. But the time, it is to be hoped, is now gone by when a defence of the study of entomology—a study which offers an inexhaustible source of rational and innocent amusement—is necessary.

“Why,” asks Ray, the illustrious founder, as he may

\* Introduction to Entomology, vol. i. p. 57, 58.

justly be denominated, of natural history in England, and whose systematical spirit threw a light on every thing he undertook, “ why were insects made attractive, if not that they might ornament the universe, and be delightful objects of contemplation to man?—Why were they arrayed in beauty, and surrounded with wonders, but that we might be led to glorify the hand that made them ?”

— “ Each crawling insect holds a rank  
Important in the scale of Him, who form'd  
This class of beings.”

“ If,” says Gedner, “ we do not think it worth our while for any other reason to turn our attention to the works of nature, yet surely for the glory of the great Creator we ought to do it ; since in every insect we may observe some singular artifice, which is not to be found in any other bodies, and which fully demonstrates the omniscience of the Supreme Being, who has created nothing but for a certain end, and for some valuable purpose ”\*

But however the hunters of Butterflies may be laughed at by the vulgar, and whatever ridicule may be thrown upon this their favourite pursuit, still the great number and variety of these insects, as well as the extreme beauty of some of them, cannot fail of attracting the notice and

\* Gedner's *Orat. on the use of Curiosity.* *Am. Acad.* vol. 3.

exciting the admiration of those who are fond of contemplating the beauties and wonders of creation, and thereby rendering the study of them a source of pleasure and instruction.

Yet even in favour of the mere Butterfly hunter, who is attached to insects solely by their beauty or singularity, it would not be difficult to say much. Can it be necessary to declaim on the superiority of a people amongst whom intellectual pleasures are preferred to animal gratification? Is it to be regretted that many of the Spitalfield weavers spend their Saint-Monday holidays in search of some of the more splendid *Lepidoptera*, instead of smoking in an alehouse? Or, is it not rather to be wished, that they should recreate their leisure hours by breathing the pure air, while in pursuit of this “untaxed and undisputed game?”

“Here is my friend the weaver; strong desires  
Reign in his breast; ‘tis beauty he admires:  
See to the shady grove he wings his way,  
And feels in hope the rapture of the day—  
Eager he looks, and soon to glad his eyes  
Appear bright troops of fresh-born Butterflies,

\* \* \* \* \*

He fears no bailiff’s wrath, no baron’s blame,  
His is untaxed and undisputed game.”

CRABBE’S BOROUGH.

There are but few individuals who have not been struck with the resplendent and gorgeous colour of some of the Butterfly tribe, and where is the human being who can behold even the most simple and unadorned of the species (*P. Brassicæ*) without associating with it the scenes of his childhood, so dear to the heart, when chasing the wayward roamer from field to field ?

“ Minions of nature !—Creatures of the skies !  
Ye bright-wing'd flutterers ! sun-born Butterflies !  
Ye living gems ! ye fairy-formed things !  
Peerless in beauty !”

SILLERY.

Insects, and more particularly Butterflies, appear to have been nature's favourite productions, in which, to recompense them for their weakness, and to manifest her power and skill, she has combined and concentrated almost all that is either beautiful and graceful, interesting and alluring, or curious and singular, in every other class and order of her children. To these, her valued miniatures, she has given the most delicate touch, and highest finish of her pencil :—

— “ Who can paint  
Like nature ? Can imagination boast,  
Amid his gay creation, hues like these ?  
And can he mix them with that matchless skill,  
And lay them on so delicately fine,  
And lose them in each other.”

THOMSON.

What numbers vie in beauty with the charming offspring of Flora! Some in the delicacy and variety of their colours ; colours not like those of flowers evanescent and fugitive, but fixed and durable, surviving their subject, and adorning it as much after death as they did when it was alive. Some, again, in the veining and texture of their wings, and others in the cottony down that clothes them ; and the rich robes of others decked with the most vivid tints of the heavenly bow, with the metallic lustre of gold and silver, or reflecting the brilliance of precious stones.

“ Their wings with azure, green and purple gloss’d,  
Studded with colour’d eyes, with gems emboss’d,  
Inlaid with pearl, and mark’d with various stains  
Of lively crimson through their dusky veins.”

BARBAULD.

The splendid appearance of the plumage of tropical birds, is not superior to what the curious observer may discover in a variety of *Lepidoptera* ; and those many-coloured eyes, which deck so gorgeously the peacock’s tail, are imitated with success in *Vanessa Io*, one of our most common Butterflies.\*

“ See,” exclaims the illustrious Linnæus, “ the large elegant painted wings of the Butterfly, four in number, covered with small imbricated scales ; with these it sustains

\* *Introduction to Entomology*, vol. i. p. 7,—10.

itself in the air the whole day, rivalling the flight of birds, and the brilliancy of the peacock. Consider this insect through the wonderful progress of its life, how different is the first period of its being from the second, and both from the parent insect ; its changes are an inexplicable enigma to us : we see a green Caterpillar furnished with sixteen feet, creeping, hairy, and feeding upon the leaves of a plant ; this is changed into a Chrysalis, smooth, of a golden lustre, hanging suspended to a fixed point, without feet, and subsisting without food : this insect again undergoes another transformation, acquires wings and six feet, and becomes a variegated Butterfly, living by suction upon the honey of plants. What has nature produced more worthy of our admiration ? Such an animal coming upon the stage of the world, and playing its part there under so many different masks ! In the egg of the *Papilio*, the epidermis, or external integument falling off, a Caterpillar is disclosed ; the second epidermis drying, and being detached, it is a Chrysalis ; and the third, a Butterfly.\*

“ Where is the silken shroud ? the grov’ling worm ?  
Where now the veil which once enshrined each form ?  
Where the cold, lifeless chrysalis of clay ?  
In gold ! in glory ! in the blaze of day ! ” SILLERY.

“ The metamorphosis of insects,” observes Paley, “ is an astonishing process. A hairy Caterpillar is transformed

\* Linnaeus Orat. on Insects. *Am. Acad.* vol. ii.

into a **Butterfly**—mark the change ! We have four beautiful wings, where there were none before ; a tubular proboscis in the place of a mouth with jaws and teeth ; six long legs instead of fourteen feet. This process must require, as it should seem, a proportionably artificial apparatus. The hypothesis, which appears to me most probable is, that in the grub, there exists at one and the same time three animals, one within another, all nourished by the same digestion, and by a communicating circulation, but in different stages of maturity. The latest discoveries made by naturalists, seem to favour this supposition. The insect already equipped with wings, is described under the membranes both of the worm and nymph. In some species, the proboscis, the antennæ, the limbs and wings of the **Butterfly** have been observed to be folded up within the body of the **Caterpillar**, and with such nicety, as to occupy a small space only under the two first rings. This being the outermost animal, which, beside its own proper character, serves as an integument to the other two, being the furthest advanced dies, as we suppose, and drops off first. The second, the *pupa* or chrysalis, then offers itself to observation. This also, in its turn dies ; its dead and brittle husk falls to pieces, and makes way for the appearance of the **Butterfly**. Now if this be the case, or indeed whatever explication be adopted, we have a prospective

contrivance of the most curious kind: we have organizations *three deep*, yet a vascular system, which supplies nutrition, growth, and life to all of them together. The art also with which the young insect is *coiled up* in the egg, presents, where it can be examined, a subject of great curiosity ”

Indeed the alteration of form, which the whole of the papilionaceous tribe undergo, affords a subject of the most pleasing contemplation to the mind of the naturalist; and though a deep philosophical survey demonstrates that there is no real or absolute change produced in the identity of the creature itself, or that it is in reality any other than the gradual and progressive evolution of parts before concealed, and which lay masqued under the form of an insect of a widely different appearance, yet it is justly viewed with the highest admiration.

“ Even in a moral point of view,” observes the ingenious author of “ *Salmonia*,” “ the analogies derived from the transformation of insects, admit of some beautiful applications, which have not been neglected by the pious Entomologists. The three states of the caterpillar, pupa, and butterfly, have from the time of the Greek poets been applied to typify the human being—its terrestrial form, apparent death, and ultimate celestial destination; and it seems more extraordinary that a sordid and crawling worm should become a beautiful active fly—that an inhabitant of

the dark and fetid dunghill should in an instant entirely change its form, rise into the blue air, and enjoy the sunbeams—than a being whose pursuits here have been after an undying name, and whose purest happiness has been derived from the acquisition of intellectual power and finite knowledge, should rise hereafter into a state where immortality is no longer a name, and ascend to the source of unbounded power, and infinite wisdom."

If any regard be paid to a similarity of names, it should seem that the ancients were so struck with the transformations of the Butterfly, and its revival from a seeming temporary death, as to have considered it as an emblem of the soul; the Greek word  $\Psi\chi\eta$ , signifying both the soul and a butterfly. This is also confirmed by their allegorical sculptures, in which the Butterfly occurs as an emblem of immortality. Nor is it very unlikely that the doctrine of metempsychosis originated from the same source. What argument, by those who maintained this doctrine, would be thought more plausible in favour of the transmigration of souls, than the seeming revivification of the dead chrysalis.

Swammerdam, speaking of the metamorphosis of insects, uses these strong words:—"this process is formed in so remarkable a manner in Butterflies, that we see therein the resurrection painted before our eyes, and exemplified so as to be examined by our hands."

Modern naturalists, impressed with the same notion, and laudably solicitous to apply it as an illustration of the awful mystery revealed in the sacred writings, have drawn their allusions to it from the dormant condition of the papilionaceous insects during their state of chrysalis, and their resuscitation from it. This idea is also beautifully expressed by the elegant author of "the Pleasures of Memory," in the following very appropriate stanzas :—

"Child of the sun ! pursue thy rapturous flight,  
Mingling with her thou lov'st, in fields of light ;  
And where the flowers of paradise unfold,  
Quaff fragrant nectar from their cups of gold.  
There shall thy wings, rich as an evening sky,  
Expand and shut with silent ecstasy.  
—Yet wert thou once a worm, a thing that crept  
On the bare earth, then wrought a tomb and slept !  
And such is man ; soon from his cell of clay  
To burst a seraph in the blaze of day."

Even the animated illustration taken from the vegetable world, so justly admired, as best calculated for general apprehension, must yield, in the force of its similitude, to that drawn from this insect's life, since nature exhibits few phenomena that can equal so wonderful a transformation.

"There is no one," says Paley, "who does not possess some particular train of thought to which the mind naturally directs itself, when left entirely to its own operations. It is certain, too, that the choice of this train of thinking may be directed to different ends, and may

appear to be more or less judiciously fixed ; but in a *moral view*, if one train of thinking be more desirable than another, it is that which regards the phenomena of nature with a constant reference to a supreme intelligent Author. Trifling, therefore, and perhaps contemptible, as to the unthinking may seem the study of a Butterfly, yet when we consider the art and mechanism displayed in so minute a structure, the fluids circulating in vessels so small as almost to escape the sight, the beauty of their wings and covering, and the manner in which each part is adapted for its peculiar function, we cannot but be struck with wonder and admiration, and must feel convinced, that the Maker of all has bestowed equal skill in every class of animated beings ; and also allow with Paley, that “ the production of beauty was as much in the Creator’s mind in painting a Butterfly, as in giving symmetry to the human form.”

It would, however, be a waste of time to prove how delightful and instructive it is to “ look through nature up to nature’s God ;” as well as an useless labour to demonstrate, that “ if any judicious or improved use is to be made of the natural bodies around us, it must be expected from those who discriminate their kinds, and study their properties.”

“ To see all things in God,” observe the authors of the Introduction to Entomology, “ has been accounted one of

the peculiar privileges of a future state; and in this present life, "to see God in all things," in the mirror of the creation to behold and adore the reflected glory of the Creator, is no mean attainment; and it possesses this advantage, that thus we sanctify our pursuits, and instead of loving the creatures for themselves, are led, by the survey of them and their instincts, to the love of **HIM** who made and endowed them." The more then we study the works of Creation, the more will the wisdom and the goodness of the Creator be manifested; and while we admire the order and harmony of the whole, or the beauty and variety of its parts, it will be impossible not to adore "**HIM** who is wise in heart, and wonderful in working," and at the same time confess with humility of soul, that "the hand that made them is divine."

LÆTITIA FORD.

*Vicarage, Navesstock, April 30, 1836.*

## INTRODUCTORY REMARKS.

“ Lo, the bright train their radiant wings unfold  
With silver fringed, and freckled o'er with gold.  
On the gay bosom of some fragrant flower,  
They idly flutt'ring live their little hour ;  
Their life all pleasure, and their task all play,  
All spring their age, and sunshine all their day.”

MRS. BARBAULD.

THE Order *Lepidoptera*, (a name derived from *λεπίς*, a scale, and *πτερόν*, a wing,) to which the Butterfly tribes belong, consists of insects which have four wings more or less covered with minute scales, and which are generally furnished with a spiral tongue (*Antlia*.\*). This Order is divided by modern Entomologists into three primary sections, and denominated Diurnal, Crepuscular, and Nocturnal *Lepidoptera*. The *Diurnal Lepidoptera* form the Linnaean genus *Papilio*, called in England *Butterfly*, from the Saxon *Buttop-fleoge*, (*Butter-fleaze*,) and so named because it first appears in the beginning of the season for butter. The characters that distinguish this section are *Antennæ* shorter than the body, consisting of numerous joints, and commonly terminating in a longer or shorter knob or clavated tip : *Labiæ Palpi* cylin-

\* *Introduction to Entomology*, vol. iii. p. 362, 469.

drical or conical, covered with scales or hairs, and usually consisting of three joints: *Maxillary Palpi* very minute: *Labia* (tongue) consisting of two pieces forming a tube for suction, which, when not employed, is generally coiled up between the palpi like a watch-spring. Other peculiar characters are to be found in them: viz. *patagia* or tippets, which adorn their thorax, and the *tegulae* or base covers, to defend their wings; a honey-bag somewhat analogous to the crop of birds; and a *colleterium* or varnish secretor, concerning the use of which physiologists are not agreed. The wings of some male Butterflies are furnished with a singular apparatus for keeping them steady, and the under wing from passing over the upper in flight. "The great number," says Dr. Shaw, "of species in this genus, makes it absolutely necessary to divide them into sections or sets, instituted from the habit or general appearance, and in some degree, from the distribution of the colours on the wings. This division of the genus is conducted by Linnaeus in a peculiar elegant and instructive manner, being an attempt to combine natural and civil history, by attaching some illustrious ancient name to an insect of such or such particular cast." The great perspicuity of his system of Entomology, however, arose from its author having made choice of the most obvious characters which insects afford for the leading distinction of his orders. In the construction of his *genera*, he has taken his characters from various parts, but paid particular attention to the form, situation, and structure of the *antennæ* or horns; these parts being conspicuous in a large proportion of insects, and often affording very satisfactory and obvious characters, and so infinitely varied in their appearance, as to constitute, with few exceptions, a permanent distinction. Other characters more recondite, and perhaps more constant and certain, have been with good effect applied by later Entomologists to

the purpose of classification. Their names are, likewise, sometimes taken from the plants on which they feed. The size of Butterflies varies but little; in the largest species, seldom above a few lines; the females are almost without exception larger than the males, and vary considerably in colour; their wings, when sitting, are usually erect, and meet upwards; their flight is in the day time.

The Butterfly requires no other food than the nectarous juices which are distilled from flowers, or the saccharine substance which exudes from the leaves of vegetables; it will sometimes alight and suck the sweets of ripe fruit that has been broken by its fall. The skies are its proper habitation—the air is its element; the pageantry of princes cannot equal the ornaments with which it is invested, or the rich colouring that embellishes its wings. There is nothing in the animal creation so beautiful or splendid as many species of these insects; they serve to banish solitude from our walks, and to fill up our idle intervals with the most pleasing speculations.

“Who loves not the gay Butterfly, which flits  
Before him in the ardent noon, array'd  
In crimson, azure, emerald, and gold;  
With more magnificence upon his wing,  
His little wing—than ever grac'd the robe  
Gorgeous of royalty; is like the kine  
That wanders mid the flowers which gem the mead,  
Unconscious of their beauty ”—

CARRINGTON'S DARTMOOR, p. 33.

Almost all insects are oviparous. Nature keeps her butterflies, moths, and caterpillars locked up during the winter in their egg state; and we have to admire the various devices to which, if we may so speak, the same nature resorts

for the security of the egg. Many insects inclose them in a silken web; others cover them with a coat of hair, plucked from their own bodies; and others glue them to the leaves upon which they are deposited, that they may not be shaken off by the wind, or washed away by the rain. Some again make incisions into the leaves, and hide an egg in each incision; whilst others envelope their eggs with a soft substance which forms the first aliment of the young animal; and some again make a hole in the earth, and having stored it with a sufficient quantity of proper food, deposit their eggs in it.\*

Butterflies in the winter generally lie hid within their cases, with their legs, antennæ, and wings closely folded over the breast and sides, and are nourished by the surrounding liquor like the *fætus* of other animals; from whence, at the approach of spring, they awake and become inhabitants of the air, when they always find their favorite aliment provided in abundance before them.

Nine-tenths probably of the extensive Order *Lepidoptera* pass the winter in the *pupa* state, which indeed is the case with all the numerous species that feed on annual plants; because as these plants have no local habitation, dying one year and springing up from seed in another quarter the next, the eggs deposited on them in autumn would not escape destruction; and even were the *larvæ* hatched before winter, and hibernate in that state, they would have no certainty of being in the neighbourhood of their appropriate food the next spring. By wintering, however, in the *pupa* state, these accidents are provided against.†

The greater part of those Lepidopterous insects which come forth in the spring or summer, perish or disappear at the

\* Paley's *Natural Theology*, p. 356, 357.

† *Introduction to Entomology*, vol. ii. p. 435.

approach of winter; there are few, the period of whose life exceeds that of a year. Some outlive the rigors of winter, from being concealed under ground, and others remain hid in the bark of trees, or in chinks of old walls; but the proportion which survives is very inconsiderable, unless it be those in the egg state. Those which are hatched in the autumn, and live under ground, or in other places of security during winter, usually come forth in the spring, take proper nourishment, and undergo their several changes to the perfect state.

When the insect has quitted the *exuviae* of the *pupa*, it has attained the last stage of its existence, and is termed an *imago*, or perfect insect. After its first exclusion it is weak, soft, and languid, and all its parts covered with moisture. The wings, instead of being of their subsequent amplitude, and painted with a variety of hues, are very small and of a dull colour, in which no distinct characters can be traced. These symptoms of debility and imperfection, however, soon vanish; the moisture of the skin evaporates; the texture becomes firm; the colours appear in their perfect beauty; and the wings expand to their full size. The proceedings here described, observe Messrs. Kirby and Spence, were witnessed very recently in that interesting and beautiful Butterfly *Papilio Machaon*, which I had the pleasure to see leave its *puparium*. With great care I placed it upon my arm, where it kept pacing about above an hour; when all its parts appearing consolidated and developed, and the animal in perfect beauty, I secured it, though not without great reluctance, for my cabinet. To observe how gradual, and yet how rapid, was the development of the parts and organs, and particularly of the wings, and the perfect coming forth of the colours and spots, was an interesting spectacle. At first it was unable to elevate or even move its wings; but in proportion as the aerial or other fluid was forced by

the motions of its trunk into their nervures, their numerous corrugations and folds gradually yielded to the action, till they gained their greatest extent, and the film between all the nervures became tense. The *ocelli* and spots and bars, which appeared at first as but germs, or rudiments of what they were to be, grew with the growing wing, and shone forth upon its complete expansion in full magnitude and beauty.\*

Thus, to use the words of Swammerdam, we see a little insignificant creature distinguished in its last birth with qualifications and ornaments which man, during his stay upon earth, can never hope to acquire:—a strong proof, that while this animal is raised to its greatest height, we are as yet in this world only candidates for perfection!

Papilionaceous insects, in general, soon after their enlargement from the chrysalis, and commonly during their first flight, discharge some drops of red-coloured fluid, more or less intense in different species. "This circumstance," observes Dr. Shaw, "is peculiarly worthy of attention, from the explanation which it affords of a phenomenon often considered, both in ancient and modern times, in the light of a prodigy:—viz. the descent of red drops from the air, which has been called a shower of blood; an event recorded by several writers, and particularly by Ovid, among the prodigies which took place before the death of Julius Cæsar.

"*Sæpe faces visæ mediis ardere sub astris,  
Sæpe inter nimbos guttæ cecidere cruentæ.*"

"With threatening signs the lowering skies were fill'd,  
And sanguine drops from murky clouds distill'd."

This highly rational elucidation of a phenomenon, at first view so inexplicable, seems to have been discovered by the

\* Introduction to Entomology, vol. iii. p. 292, 293.

celebrated Pieresc, at Aix, in Provence, where a shower of this kind fell in 1608. The common people were terrified with the apprehension of some great general calamity ; but that intelligent naturalist, enquiring into the affair with minute attention, was fully convinced that these drops were scattered by an innumerable swarm of the *Vanessa C. Album*, hovering in the air ; he preserved several of the caterpillars of this insect in a glass, which after their transformation discharged these drops of blood. This discovery ruined two hypotheses, which had been supported with equal ability—one, that it was the work of evil spirits ; the other, that these drops were formed from red exhalations precipitated again in rain.\*

The same notion was also entertained by Swammerdam, though he does not appear to have verified it from his own observation.

“ Some people,” says Pliny, “ think the appearance of the Butterfly the surest sign of spring, on account of the delicacy of the animal.” And certainly these insects may generally be regarded as precursors of fine weather. The elegant brimstone Butterfly, *Gonepteryx Rhamni*, usually bursts from its chrysalis in March, and is the herald of the whole tribe ; this is succeeded by the large and small tortoise-shell *Vanessa Polychloros* and *Urticæ* ; and in the following month, among many others, by *Pontia Brassicæ*, the large white cabbage Butterfly, which has ever been regarded as an index of settled skies, and a symbol of summer.

One of the superstitions prevailing among the lower classes in Devonshire is, that any individual neglecting to kill the first Butterfly he sees in the year, will have ill luck throughout it. The Dorset Chronicle recently furnished a ludicrous

\* Avelin *Miracula Insectorum*, Am. Acad. vol. iii. p. 320.

example of this vulgar error; which, for the sake of the unoffending insect, it is to be hoped is so purely provincial as to be confined to those counties. It was from a different feeling that Shakspeare, in his inimitable *Midsummer Night's Dream*, makes the Queen tell her Fairies, in their charge of Oberon, to

— “pluck the wings from painted Butterflies  
To fan the moon-beams from his sleeping eyes.”

The Butterfly is one of the principal ornaments of oriental poetry; but in those countries, the insect is larger and more beautiful than with us.

Lord Byron thus elegantly alludes to one of the most splendid and rare of the species, “the blue-winged Butterfly of Kashmeer.”

“ As, rising on its purple wing,  
The insect queen of eastern spring  
O'er emerald meadows of Kashmeer  
Invites the young pursuer near,  
And leads him on from flower to flower,  
A weary chase and wasted hour;  
Then leaves him, as it soars on high,  
With panting heart and tearful eye.  
So beauty lures the full-grown child,  
With hue as bright and wing as wild,  
A chase of idle hopes and fears,  
Begun in folly, closed in tears;  
If won, to equal ills betray'd,  
Woe waits the insect and the maid.

• • • • •  
The lovely toy so fiercely sought  
Has lost its charin by being caught,  
For every touch that wooed its stay  
Has brush'd its brightest hues away,  
Till charm, and hue, and beauty gone,  
'Tis left to fly or fall alone.”

THE GIAOUR.

Insects, under all their varieties of form, are endowed with *antennæ*, which is the name given to those long organs that rise from each side of the head; but to what common use, or want of the insect kind, a provision so universal is subservient, has not yet been clearly ascertained. They have been regarded by some as organs of *smell*, and by others as organs of *touch*; but though they may be used occasionally in exploring by touch, this is neither their general nor their primary use, for the *antennæ* of very great numbers never are or can be employed for this purpose. It is most probable that they are the organs of a sense not perfectly analogous to any of ours, but coming nearest to that of *hearing*, for they certainly collect notices from the atmosphere. This unknown sense Lehmann (who is the patron of the hypothesis that makes them primarily *tactus*) calls *aëroscpsy*.\*

An extraordinary instance of irritability is exhibited by the *antlia*, or instrument of suction of the Butterfly. If this organ, which the insect can roll up spirally like a watch-spring, or extend in a straight direction, be cut off as soon as the animal is disclosed from the chrysalis, it will continue to roll up or unroll itself as if still attached to its head; and if, after having apparently ceased to move for three or four hours, it be merely touched, it will again begin to move and resume the same action. This is doubtless occasioned by the peculiar structure of the *antlia*, which is composed of an infinity of horny rings acted upon by muscles, more numerous, probably, than those which move the trunk of the elephant. The motion only ceases when the muscles become dry and rigid.†

The *Larvæ* of Butterflies are universally and emphatically

\* See *Introduction to Entomology*, vol. iv. p. 235, &47, where this subject is largely discussed.

† *Introduction to Entomology*, vol. iv. p. 191, 192.

known by the name of *Caterpillars*. The body of the Caterpillar, when anatomically considered, is found composed of rings, whose circumference is nearly circular; they are generally twelve in number, and are membranous. The head of the Caterpillar is attached to the first ring by the neck. The general shape of their bodies is cylindrical, and a few of them are transparent; the contour of their head being usually entire and unbroken. Some are quite naked and smooth, or rough only with granular elevations, or tubercles. A considerable number are clothed with hair or bristles, and some armed with spines so stiff as to pierce the skin. Bonnet remarks, that a great number of Lepidopterous *luræ* have between the under lip and fore legs a slender transverse opening, containing a teat-like protuberance, which they can either wholly retract and conceal, or by pressure extend to the length of one of the legs. The use of this is not clearly known; some have supposed it to be a second spinneret, and to be of service in fabricating the cocoon; but it is more probable that it secretes some other kind of fluid, and is connected with defence, and is intended to drive away the Ichneumons which reign over the whole of the Lepidopterous *luræ* with undisputed sway. It is the opinion of many entomologists that the long hairs, stiff bristles, sharp spines, and hard prominences which distinguish others, are also afforded as a means of defence. This is rendered more probable by the fact, that in several instances the animals so distinguished, previously to their assuming the pupa, appear with a smooth skin. They are furnished also with *palpi*, jaws, six little eyes on each side of the head, and spiracles or oval openings, through which the insect breathes; the colour of which is often so contrasted with the rest of the body, as to produce a striking effect. This contrast is frequently rendered more obvious by their

position, as in those whose sides are striped, the spiracles are sometimes planted in it, or just above it, or between two. Lepidopterous *larvæ* have either ten, eight, six, or two pro-legs, seldom indeed more and never fewer. Of these, with few exceptions, two are attached to the last or anal, and the rest, when present, to one or more of the sixth, seventh, eighth, and ninth segments of the body: none are ever found on the fourth, fifth, tenth, or eleventh segments.

Many *larvæ* of *Lepidoptera* unite in some common work for the benefit of the community, and continue together while their united labours are beneficial to them; but when they reach a certain period of life, they disperse and become solitary. Of this kind are the Caterpillars of a little Butterfly (*Meitira Cinnia*), which devour the narrow-leaved plantain. The families of these, usually amounting to about a hundred, unite to form a pyramidal silken tent, containing several apartments, which is pitched over some of the plants that constitute their food, and shelters them both from the sun and the rain. When they have consumed the provisions which it covers, they construct a new one over other roots of this plant; and sometimes four or five of these encampments may be seen within a foot or two of each other. Against winter they weave and erect a stronger habitation of a rounder form, not divided by any partitions, in which they lie heaped one upon another, each being rolled up; about April they separate and continue solitary till they assume the *pupa*.\*

The *larvæ* of the cabbage Butterfly, (*Pontia Brassicea*), when about to assume the *pupa* state, commonly fixes itself to the under side of the coping of a wall, or some similar projection; but the ends of the slender thread which

\* *Introduction to Entomology*, vol. II, p. 20.

serves for its girth will not adhere firmly to stone, or brick, or even wood, in such situations, therefore, it previously covers the space of about an inch long, and half an inch wide, with a web of silk, to the extensive base of which its girth can be securely fastened. This insect disposes its eggs side by side, so as to resemble a close column of soldiers; in consequence of which, on hatching, those *larvæ* which proceed from the upper end, cannot disturb the adjoining eggs.\*

That accurate observer of nature, accomplished scholar, and highly pleasing poet, the late Rev. Dr. Hurd, has thus minutely described the birth and habits of the Caterpillar.

" Hatch'd by the sun-beam from contiguous cells,  
Around the slender apple-twigs combin'd  
In circuit orderly, egg glued to egg,  
Issue the *Caterpillar* swarm minute.  
There left, oviparous, her half-born brood,  
Ere summer clos'd, the parent left and died.  
There have they still endur'd, and still surviv'd  
Sharp winter's tyranny; the bitter frost,  
That slew the myrtle, and the lasting leaf  
Of the screen'd laurel chang'd, no death to them.

Now busily convened, upon the bud,  
That crowns their genial branch, they feast sublime,  
And spread their muslin canopy around,  
Pavillion'd richer than the proudest king."

FAVORITE VILLAGE.

The Caterpillar, whose life is one continued succession of changes, may be regarded as a locomotive egg, having for its embryo the included Butterfly: it often moults its skin before it attains its full growth; and it is not simply the skin that is changed, for when it moults, in the *cauricæ* are found

\* Introduction to Entomology, vol. iii. p. 79, 80.

the skull, jaws, and all the exterior parts, both scaly and membranaceous, which compose its upper and under lip ; its *antennæ*, *palpi*, and even those crustaceous pieces within the head, which serve as a fixed basis to a number of muscles, with the spiracles, the claws, and sheaths of the anterior legs, and in general the traces of all that is visible in the external figure of the Caterpillar. This change is effected by the insect withdrawing itself from the outer skin, when it finds itself incommoded from being confined within too narrow a compass ; but to accomplish this change, is a painful process, and the work of some labour and time ; it generally fasts a whole day after moulting. The Caterpillars of Lepidopterous insects, with the few exceptions before mentioned, are destitute of all means of defence, and are the prey of birds and other voracious creatures. Many of them feed close to the ground, or under the surface, subsisting on the lower parts or roots of plants ; and for this reason are seldom seen, and remain unknown. Many also are of the colour of the plant on which they feed, and hence they are with difficulty discovered by their enemies. A large proportion of them are green of different shades, sometimes beautifully contrasted with black bands ; a circumstance which renders the Caterpillar of one of our finest insects *Papilio Machaon*, of this order, as lovely as the fly. No general judgment, however, can be formed of the beauty of the future fly, from the colour of the *larvæ* ; for it often happens that the splendid Caterpillar gives a plain Butterfly, and *vice-versa*. A Caterpillar in its adult state, is the most ravenous of all animals ; it will eat double its own weight of leaves in one day. These voracious habits, with its slow crawling motion, render these insects, notwithstanding the beauty and variety of their colouring, not the most agreeable objects of human curiosity. There are, however, many Naturalists

who have spent years in their contemplation ; and who have not only attended to their habits, but minutely examined their structure and internal conformation. One species of motion peculiar to Caterpillars is their mode of climbing and descending, which they effect by ladders or a single rope. The Caterpillar of *Pontia Brassicæ*, the large white or cabbage Butterfly, scales walls and even glass windows, without difficulty ; but in the last instance, if the square upon which the animal is travelling be examined with a microscope, a visible track like that of a snail may be seen. This consists of little silken threads which it has spun in a zig-zag direction, forming a rope ladder, by which it ascends a surface it could not otherwise adhere to. These threads being of a gummy nature, harden in the air and easily attach themselves to the glass. Some of the Lepidopterous Caterpillars are solitary, while others live in society. "A Caterpillar, when grown to its full size, retires to some convenient spot, and securing itself properly by a small number of silken filaments, either suspends itself by the tail, hanging with its head downwards, or else in an upright position, with the body fastened round the middle by a proper number of filaments. It then casts off the Caterpillar skin, and commences chrysalis ; in which state it continues till the enclosed Butterfly is ready for birth, which, liberating itself from the skin of the chrysalis, suddenly quits the state of inactivity to which it had been so long confined, and becomes at pleasure an inhabitant of the air."\*

This wonderful resuscitation has been so spiritedly described by the French poet of nature, that no apology will, I trust, be required for the insertion of the following extract from his "*Jardins.*"

\* Shaw, vol. vi. p. 206.

“Voyez ce *Papillon* échappé du tombeau,  
 Sa mort fut un sommeil, et sa tombe un berceau ;  
 Il brise le fourreau qui l’echainait dans l’ombre ;  
 Deux yeux paraient son front, et ses yeux sont sans nombre ;  
 Il se trainait à peine, il part comme l’éclair ;  
 Il rampait sur la terre, il voltige dans l’air.”

DE LILLE.

Nor can I resist offering another equally applicable quotation from the amiable Hurdis :

“Behold again with saffron wing superb,  
 The giddy Butterfly. Releas’d at length  
 From his warm winter cell, he mounts on high,  
 No longer reptile, but endowed with plumes,  
 And through the blue air wanders ; pert alights,  
 And seems to sleep, but from the treacherous hand  
 Snatches his beauties suddenly away,  
 And zig-zag dances o’er the flowery dell.”

FAVORITE VILLAGE.

The clothing of the organs of flight of the Butterfly excites the admiration of the most incurious beholder. The gorgeous wings of these universal favorites owe their beauty to an infinite number of little plumes, thickly planted in their surfaces, and so minute as to seem like powder ; but which are in fact an innumerable number of small scales varying in shape and length in different species, and discoverable only by the assistance of a microscope. Peculiar beauties of hue sometimes distinguish a whole genera or family. What can be more lovely than that tribe of little Butterflies which flit around us everywhere in our summer rambles, which are called Blues, and which exhibit the various tints of the sky ? Among these, *Polyommatus Adonis* scarcely yields to any exotic Butterfly in the celestial purity of its azure wings.

Our native Coppers, also, *Lycaena dispar*, *Virgaureæ*, &c. are remarkable for the fulgid colour of these organs; in *Argynnis Paphia*, *Aglaia*, &c. the upper side of their wings is tawny and spotted with black, while the underside of the secondary one is adorned by the appearance of silver spots.\*

From the magnitude and strength of the wings of many species it might be supposed that in those that fan with "sail-broad vans," they would not be silent in the air, yet they produce little or no sound by their motion. They are excellent flyers, and seem to flit untired from flower to flower, and from field to field.

"Above the sovereign oak, a sovereign skims,  
The *Purple Emperor*, strong in wing and limbs;  
There fair *Camilla* takes her flight serene,  
*Adonis* blue, and *Paphia*, silver queen."

CRABBE'S BOROUGH.

The distance to which some males will fly is astonishing. The flight is effected by dipping and rising alternately, so as to form a zig-zag line with vertical angles, which the insect often describes with a skipping motion, so that each zig-zag consists of smaller ones. This renders it difficult for the birds to take them in their flight.

Butterflies, when standing still in the sun, as doubtless has been frequently observed,

"Their golden pinions ope and close;"

thus it should seem, unless this motion be connected with their respiration, alternately warning and cooling their bodies.†

\* Introduction to Entomology, vol. iii. p. 651, 652.

† Ibid, vol. ii. p. 305.

It is very amusing to observe, in the bright sun of an August morning, the animation and delight of many of the Lepidopterous insects. That beautiful little blue Butterfly, *Polyommatus Argus*, is then all life and activity, flitting from flower to flower in the grass, with remarkable vivacity; there seems to be a constant rivalry and contention between this beauty, and the not less elegant little beau *Lycaena Phœas*. Frequenting the same station, attached to the same head of clover or harebell, whenever they approach, mutual animosity seems to possess them; and darting on each other with courageous rapidity, they buffet and contend until one is driven from the field, or to a considerable distance from his station, perhaps many hundred yards, when the victor returns to his post in triumph.

*Pupæ*, or *Chrysalides*, as to their general figure, may be divided into two classes. The first class consists of angular *pupæ*, or those which have angular projections on different parts of their body; the second of conical, or those which have no such projections, (the *anal mucro* excepted.) Each of these classes affords variations which require to be noticed. The surface of the skin of the greater number of *pupæ* is smooth, but in some it is rugose and warty; this is particularly apparent in that of *Papilio Machaon*. In the *pupæ* are discoverable evident traces of ten dorsal segments; and in that of the above-named species, there is a deep channel between the third and fourth segments. A pretty accurate judgment of the perfect insect may sometimes be formed from the figure of its chrysalis, which frequently takes the rude outline of the parts of the animal which is contained within it; but the various colours which it is seen to assume, appear the effect of accident, for the same species does not always assume the same hue.

It remains torpid for a longer or shorter period ; frequently hanging to different substances by means of threads attached to its middle or tail. As these *pupæ* are often tinged with a golden colour, they were called from this circumstance *chrysalides* by the Greeks, and *anreliæ* by the Romans, both which terms are in some measure become anglicized ; and though not strictly applicable to ungilded *pupæ*, are now given to those of all Lepidopterous insects. In some, the beautiful gold tinge is at one time found ; in others, it is wanting. This brilliant hue is formed by a transparent brown varnish, laid upon a white ground, which gleaming through gives a golden yellow, so that the whole appears gilded without any real gilding. The habitats of the eggs are almost all in the vicinity of the food of the *luræ*, and in most instances concealed about some part of it. The eggs and *chrysalides* of some of the species will lie dormant, it should seem, for several years ; it being an undoubted fact, that a species of Butterfly shall be plentiful one year, and not be seen again till many years after. From the numerous experiments of various celebrated naturalists, it clearly appears that cold does not destroy the vital principle in the eggs of insects ; and it has often been noticed, that after a severe winter they were more numerous in the succeeding spring and summer.

## DIRECTIONS

FOR COLLECTING AND PRESERVING

BUTTERFLIES, CATERPILLARS, &amp; CHRYSALIDES.

"How varied is the scenery to which the diversion of the Aurclianist introduces him; he is never out of his way:—whether on hill or in valley; on upland or plain; on the heath or in the forest: still his game is within his reach."

INTRODUCTION TO ENTOMOLOGY.

HAVING, in the foregoing Introductory Remarks, given an account of the peculiarities of Butterflies, their local distribution, and favourite haunts, (a knowledge of which is indispensable to the collector), must now be noticed. Their choice is exceedingly varied; some inhabit the open *Fields*, many are to be found in the sheltered *Copse*, in warm and sunny *Lanes*, and among thick *Hedges*.

The vicinity and borders of *Woods* generally abound with these beautiful insects, and furnish, among numerous other prizes of *Lepidoptera*, the beautiful *Apatura Iris*, or the Purple Emperor.

*Morasses* and *Marshes* have their peculiar insects; and, among others, that scarce and brilliant Butterfly, *Lycaena Virgaureæ*, which is to be found only in such soil. *Heaths*, also, have their rarities, and are the haunts of many of the

beautiful tribes of *Fritillaries* and *Blues*. *Chalk*, too, has its attractions for some of the latter genera, and particularly for *Polyommatus Corydon*, which is principally found in chalk pits.

*Vegetable earth* affords a harbour to various *larvæ* and *pupæ*.

Butterflies fly generally only in the day. They accompany the sun in his course, and before he sets disappear. With us, says Mr. Samouelle, many of the species are extremely local; and, from the shortness of their lives, require greater assiduity in the collector, and a wider range of search, than is generally supposed. As an illustration of this fact, we must observe that the number of *Papilionidæ* found in England, is about seventy-two. Of this number not more than fifty are to be met with within twenty-five miles of London; and of these several are confined to the vicinity of a chalk-cliff, or are peculiar to a meadow or a certain wood. Even in these situations their appearance in the perfect state is limited but to a few days, and at a certain season of the year. Of the remaining number, not found within this distance from London, some are confined to fens, nearly a hundred miles distant from the metropolis, and others to the mountains of Scotland; but they are all equally limited in the times of their appearance and the shortness of their lives. There is also another circumstance in the history of these insects, which must not be passed over in silence; and that is, there are several species which, from some hitherto unknown cause, appear in the proper season, but in certain years only, when they will be found in abundance, and probably extended over a vast track of the country. These, however, disappear, and not a single specimen is to be found for a period of many years, when they will again be seen as plentiful as before. This is a circumstance that is not con-

fined to England, where it might be attributed to our "ever varying clime ;" but occurs also in tropical countries.\*

When winter has dismantled the trees of their foliage, nature is deprived of her Butterflies ; by the genial influence of spring, however, our groves, hedges, and fields are again peopled, and Caterpillars are to be seen feeding upon the promise of the year, even before the leaves are completely unfolded. The same power that pushes forth the budding leaf and opening flower, impels the insect also to animation, and the guest and banquet appear furnished together. It is in pursuit of Butterflies and Caterpillars, as well as other insects, that we are favoured with the visits of many of our most beautiful songsters, who delight us only during their continuance, and leave us when they disappear.

Caterpillars are found in Europe from the spring to the autumn of the year, and some live through the winter ; in this state, however, they decrease in bulk, but are still attached to the stems of trees. On the rising of the sun they resume their usual vigour, and after feeding on the tender shoots, as summer advances, retire to the pupa state.

At the beginning of April they may be plentifully found amid various kinds of trees, shrubs, plants, and weeds. Several smart strokes with a beating stick will be necessary to dislodge many of the Caterpillars. The best time for obtaining them is very early in the morning and late in the evening, as the greater part feed only during the night and conceal themselves by day. The middle and latter end of May is the harvest to the collector of spring Caterpillars ; or if the season be backward, from the beginning to the middle of June. Care must be taken to put with the Cater-

\* Samouelle's Directions for Preserving Insects, p. 18, 43.

pillars some leaves of the different plants on which they were found ; and also to carry home a good supply. They should be removed as soon as possible with fresh food to the breeding cage.

The Aurelianist who wishes to secure fine specimens of Butterflies for his cabinet, should procure them either in the larva or pupa state ; and if in the former condition, they must be fed on their natural vegetable diet, till they have attained their full size, and are changed into the pupa, when they must be carefully kept till they assume the imago or perfect state ; as they are generally more or less injured when caught flying : many species, however, are only to be obtained in their winged state ; their caterpillars or *chrysalides* being unknown. A simple and successful method will often bring down Butterflies in their most rapid flight : viz. by throwing up a stone or piece of tile before them, which they will often fly down with and alight on the ground, and are then easily captured. Some species, although often disturbed, will visit the same blossom many times, and thus by watching their haunts may be taken without much fatigue. At an early hour in the morning, and before sunset, many will be found on the flowers at the skirts of woods and in marshes.

It is useless to go out to collect Butterflies if the weather be cold or windy, as, at such times, they conceal themselves. A warm, damp air, such as succeeds a gentle shower of rain, is what they prefer, when they fly near the earth to enjoy the humidity which arises from the ground. In hot and dry days, Butterflies may usually be seen settled in great numbers on the mud of ditches ; from this it may be inferred, that heat, united with moisture, is most agreeable to their nature. *Pontia Brassiceæ*, the large white cabbage Butterfly,

may be regarded as a token of fine weather. When any number of this species are on the wing early in the morning, it rarely happens but a fine day ensues.

It will next be necessary to describe the instruments with which the Aurelianist should be provided, as well as the best method of employing them. First, he must be prepared with a STRONG KNIFE, or what is styled by Mr. Samouelle a DIGGER, which consists of an iron five inches long, and rather more than one-third of an inch in diameter, forming a curve towards the extremity, and terminating in a lozenge-shaped point, strongly fixed in a wooden handle. The use of this is to explore the interior of timber trees, and to grub up the turf under them, as well as to examine the earth for the *pupæ*. But what is yet better for this purpose is a potatoe fork. Secondly, a STICK, to beat the branches of trees, with a screw fitted at one end, with a brass cap to keep out the dirt. For catching the Butterfly in its flight, a BAG-NET is essentially necessary. This must be formed of two semicircular pieces of iron or brass wire hooked together at one end, and at the other made to lap over the corresponding piece, and pierced so as to receive the screw at one end of the stick. When not employed, the hoop may be doubled up and concealed under the vest. To this must be affixed a muslin bag, two feet in length. This sort of net fixed to a pole twenty or thirty feet long is, Mr. Haworth says, the best net for capturing *Apatura Iris*, the Purple Emperor Butterfly. An adroit collector by giving it a certain twist completely closes the mouth so as to prevent the escape of his captives.

The FLY-NET is also much used. This should be made of white gauze or coarse muslin; and the rods of tough wood, about five feet in length, half an inch in diameter, and gradually tapering to the end. Each of these rods should

consist of four joints, with sockets for the convenience of carriage, and the terminal joint must either be bent into a curve, or fitted with an angular socket or ferrule, so as to form an obtuse angle with the rest of the rod. The gauze which is to form the net being cut into the requisite shape, should be welted round except at the bottom, where it should have a deep fold or bag for preventing the escape of the captive, and in order to form a slide for the rods to slip in. At the apex where they meet, a few stitches should be set, or a piece of leather sewed in, to prevent their going too far. At the bottom, on each side two strings must be sewed on the net; to receive which, there must be a hole in each rod about six inches from the bottom; these must be tied, which will keep the net from slipping upwards.

When the FLY-NET is used, it may either be held with one hand with the rods crossed, in which way it is more readily elevated, if the insect rises; or the rods may be taken one in each hand, so as to keep it extended, and when fairly beyond the insect pursued, the two sticks must be brought together to secure it.

Under this head may be mentioned a very ingenious net for taking Butterflies, invented by Dr. Maclean, of Colchester, which may be called MACLEAN'S ELASTIC NET. It is constructed of two pieces of stout split cane, connected by a joint at each end, and with a rod which lies between them, in which a pulley is fixed; through this a cord fastened to the canes passes; a long cane with a ferrule receives the lower end of the rod and forms a handle; and to the canes is fastened a net of green gauze. Taking the handle in the right hand, and the string in the left, when the latter is pulled the canes bend till they form a hoop, and the net appended to them is open; when the Butterflies are in it, relax the cord, and the canes become straight and close the

mouth of the net, keeping them close with the left hand, they may soon be disabled with the right.

The Germans for the capture of *Lepidoptera*, when settled on plants, use a large and long pair of *Forceps*, having octagonal leaves of ten or twelve inches in diameter, covered with green ganze or fine catgut, which are held and moved like a pair of scissars. In aiming at an insect with *forceps*, the leaves should be expanded as wide as possible, and the prey approached very cautiously, and when within reach, close them upon it suddenly, including the leaf or flower on which it rests. As these are sometimes bulky, and prevent the instrument from shutting closely, that the included insect may not escape, it is sometimes necessary to use the other hand to bring them together, when the pressure of the finger and thumb soon disables it.

One great object of the collector of Butterflies is to bring them *safely* home. As soon then as they are taken, and disabled as much as possible without injury, they should be transfixed with a pin and put into a pocket box lined with cork, or an oblong chip one, with paper pasted over it, and lined at the top and bottom. Butterflies may be easily killed by pressing the breast betwixt the finger and thumb, and then passing a pin through the thorax. Mr. Haworth advises as the means of certain and speedy destruction, that the needles or pins should be red-hot; but this is only necessary with the larger species. They may also be destroyed by placing them on a plate under an inverted tumbler, and setting it before the fire a minute or two. A better method recommended by Mr. Kirby, is to fix the impaled insects on a piece of cork, or any soft wood, such as elder or willow, across the bottom of a mug, then to invert it in a deep basin, into which pour boiling water till it is covered, holding it firmly down that the expansion of the

included air may not overturn it; in two minutes or less, all the insects will be dead and not all wetted. Butterflies are also said to be readily killed by suffocating them with the fumes of a lighted match under a basin. Great care should be taken that the *antennæ* or legs are not injured.

When any of the Butterflies are extended on the setting board beneath the card braces, let them remain in that situation, till the aqueous moisture, and the oily and saline particles also, be evaporated; otherwise the wings will not only start from their natural position, but the bodies, with the *antennæ*, will grow mouldy when in the cabinet; and what is of worse consequence, breed millions of *animalcules*, which, except some remedy is applied, will infallibly destroy them. They should therefore be kept in some dry place, open to the air, but free from dust, for a considerable time before they are placed in the cabinet.

If at any time the preserved insect should appear as if growing mouldy, or be infested with small *animalcules*, which may be known by a kind of dust seen beneath the abdomen, the only effectual remedy is the smoke of tobacco, which must be blown through the small end of a pipe, through a hole made for that purpose, at the back of the drawer or box which contains them. This not only corrects the putrid and stagnant air, but kills those formidable enemies which often destroy whole cabinets of insects. This process will preserve them for twelve months, when it will be necessary to repeat it. The smoke will not in any degree injure the beauty of the insects.

The COLLECTING Box should be about four inches deep, and corked at top and bottom. A large chip box, being light, answers well. Camphor in muslin, or a small piece of sponge saturated with spirits of turpentine, should be placed in the box; the effluvia tending to destroy life.

The LARVÆ Box should be of chip, and covered at the top and bottom with gauze, for the admission of air. A few leaves of the plants on which the Caterpillars feed, should be put into the box with them. A perforated tin box is sometimes preferred by entomologists, as best for retaining the moisture of the plants.

The STORE Boxes should be made of yellow deal, well saturated with spirits of turpentine, and about two feet long, fourteen inches wide, and five inches high; divided down the middle, like a backgammon board, with a cell at each end for the reception of camphor. A ledge of half an inch should rise on the inside of the lower half to exclude dust. The boxes must be lined with a sheet of cork, both at top and bottom; and the edges should be covered with paper pasted on them to exclude the air and dust.

The BREEDING CAGES, used for rearing insects from caterpillars, should be made of wainscot, and of a square form, with the sides and front covered with gauze. In the centre of the box should be a tube for the reception of a bottle of water, in which the stems of the plants should be put to keep them alive. A succession of fresh plants and clean cages, are also essential to the obtaining fine specimens of the perfect insects. The cause of the deaths of the Caterpillars, found at the bottom of cages or pocket-boxes, is generally attributed to bruises got in beating the trees when collecting them; but this is a great mistake, as those, which happen to be injured in beating, seldom die till the time of changing their skin, or of their transformation.

The PINS. The size of the pin must be regulated by that of the insect: the kind called short whites, are perhaps preferable for Butterflies; and in piercing them, care should be taken to force the pin sufficiently through the thorax to hold them firm, and keep them at a proper distance from

the bottom of the case, to prevent the breaking of their legs or *antennæ*. Needles must never be used for impaling these insects, as they always rust.

The **SETTING NEEDLE** is simply a common needle fastened into a thin piece of wood, about three inches long; on the other end of which a camel's hair pencil may be secured. A pin curved towards the point and fastened into a piece of wood, will also be found useful. These instruments are employed in extending the wings and legs of the insects, and the pencil for brushing off the dirt.

The **SETTING BOARDS** are formed of pieces of board covered with cork, about a quarter of an inch thick, and papered.

The **BRACES** are merely triangular slips of card used for confining the wings of insects.

**CABINETS.** These should be made of well-seasoned mahogany or wainscot; as deal is liable to warp and split. Strips of velvet should be glued round the edges of the doors, to make them shut close and keep out the dust. The drawers which contain the insects should be lined with cork at the bottom, and covered with fine wove paper; they must also be glazed, to prevent admission of dust or air: small holes should be bored in the side of the drawers, to emit the scent of the camphor. Cabinets should always be placed against a partition wall in a dry room.\*

**THE MODE OF ARRANGING BUTTERFLIES.** This will in a great measure depend upon the taste of the collector:—perhaps the best method is to place them (or indeed any other insects) in columns with the generic name at the head of each column, and the Linnaean and English name affixed to each species. Males and females should be placed together,

\* Ingpen's Instructions for Collecting, Rearing, and Preserving British Insects, p. 16—19.

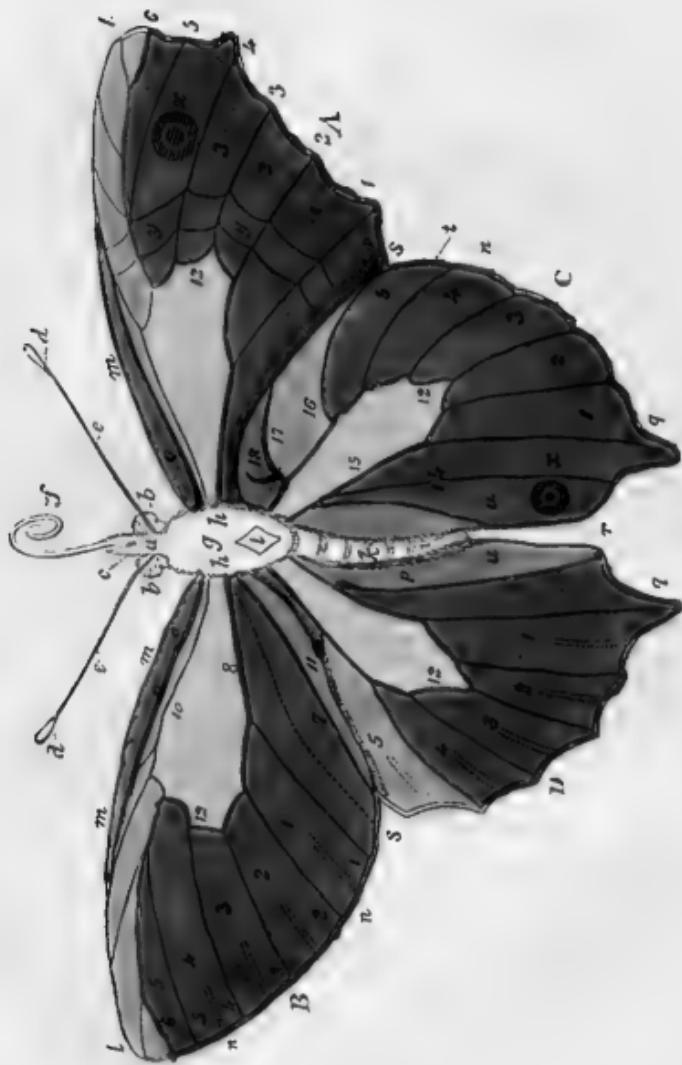
and if they can be had, it is desirable to have two specimens of each, for the purpose of exhibiting both the upper and under side.

**TO PRESERVE CATERPILLARS.** The animal must first be killed by immersion in spirits of wine, the contents of the body must then be emptied by the gradual pressure of the finger and thumb, beginning at the head, and pressing on to the *anus*; at which part a small aperture should be previously made. When the skin is cleared, a piece of hay or slender straw must be introduced into the *anus*, round which and near to the extremity, a fine thread must be loosely passed, the tube is then to be blown through, and when the skin is fully inflated, withdrawn, at the same time the thread must be pulled tight and secured by a knot. The Caterpillar will now exhibit its proper shape and colours; to retain which, all that is necessary is to hold it near the fire until perfectly dry, which will be in a few minutes. Another method is, when the contents of the body are removed as above, to fill the skin with very fine dry sand; by this means the insect is brought to its natural shape; in a few hours the skin will dry, and the sand may be shaken out. Caterpillars, thus prepared, may be either pierced with a pin, or gummed on a strip of card. They may also be preserved without any further preparation by merely suspending them from a cork in a phial, filled with spirits of wine. The phial should be close stopped, and the cork dipped in wax. When Caterpillars, either from their rarity or otherwise, cannot be preserved, a coloured drawing should always be made of them, when come to their full size.

**CHRYSALIDES** should be carefully put into a box, carried for the purpose, having damp earth placed at the bottom; care being taken to move them as little as possible. They should afterwards be placed in a breeding cage or garden

pot. In the preservation of the *Chrysalides* during the winter, it will be necessary to keep them in cold and moist places, as in a cellar or out-house, or the greater part of them will be killed; for dry warmth is apt to exhale the nutritive moisture from them, harden the shell and weaken the insects so much, that at the time when they should appear in their winged state, they have not strength left sufficient to burst open the chrysalis and come forth from their confinement. The shells of *Chrysalides* have merely to be pierced through with a pin, or gummed on a piece of card when the insects have left them; or, if it be wished to kill a chrysalis, it may be done in a moment by dropping it into scalding water. Mr. Donovan says, that "if the *Chrysalides*, which have the appearance of gold, be put into spirits of wine, they will always retain that colour; but if the insect within be killed first, or if the fly has quitted it, such appearance is entirely lost."





## TERMS

USED IN THE DESCRIPTION OF THE VARIOUS  
PARTS OF THE BUTTERFLY.

The author, in this edition, as Harris's terms respecting the wings of Butterflies, (which were inserted in the first edition of this work,) are mostly obsolete, has, instead of them, adopted those of the authors of the "Introduction to Entomology." But as the reference letters and figures of the plate are those relating to Harris's terms, some little inconvenience was experienced in adapting them to the new system. It is hoped, however, that they will be intelligible to the reader.

## EXPLANATION OF THE FIGURE.

**COSTAL AREA**, purple and yellow.

*Introduction to Entomology*, vol. iii. 374, *a* 623.

**INTERMEDIATE AREA**, pink and green.

*Ibid*, vol. iii. 374. *b* 623.

**ANAL AREA**, blue.

*Ibid*, vol. iii. 374, *c* 623.

**COSTAL AREOLET**, purple.

*Ibid*, vol. iv. 342, No. 1.

**POSTCOSTAL AREOLETS**, yellow.

*Ibid*, vol. iv. 342, No 2.

**BASAL AREOLET**, pink.

*Ibid*, vol. iii. 375, *a*.

**APICAL AREOLETS**, green.

*Ibid*, vol. iii. 375, *c*.

<i>a</i>	The Head.	
<i>b b</i>	'The Eyes.	
<i>c</i>	The Labial Palpi or Feelers. <i>Introduction to Entomology</i> , vol. iii. 356, <i>b</i> .	
<i>d d</i>	The Knob of the Antennæ.	
<i>e e</i>	The Footstalk of ditto.	
<i>f</i>	The Antlia or Tongue. <i>Ibid</i> , 362. No. 4.	
<i>g h h i</i>	The Trunk to which the Wings are affixed. <i>Ibid</i> , 367.	
<i>i</i>	The Scutellum. <i>Ibid</i> , 378. D. and 557.	
<i>k</i>	The Abdomen with its Segments. <i>Ibid</i> , 387.	
<i>S A l m</i> , <i>S B l n n m m</i>	Primary or Upper Wings.	
		<i>Ibid</i> , iv. 335. <i>b</i> .
<i>l m m</i>	Anterior Margin of the Wing. <i>Ibid</i> , 339, F. No. 1.	
<i>S h</i>	Interior Margin of ditto. <i>Ibid</i> , — No. 2.	
<i>l A S</i> , <i>l B n n S</i>	Posterior Margin of ditto. <i>Ibid</i> , — No. 3.	
<i>l A S</i>	Angulate Wing. <i>Ibid</i> , 328, No. 15.	
<i>l B n n S</i>	Rotundate ditto. <i>Ibid</i> , 295, <i>n 7</i> .	
10	Mediastinal Nervure. <i>Ibid</i> , iii. 376, <i>c</i> .	
8	Externo-medial and Interno-medial Coalesced to form one Nervure. <i>Ibid</i> , 376, <i>d e</i> 631.	
<i>u q C S</i> , <i>u q D S</i>	Secondary or Under Wings. <i>Ibid</i> , iv. 336, <i>b</i> .	
	Margins and Areas same as in the primary Wings	
18	Tendo, the Tendon. <i>Ibid</i> , iii. 381, <i>b ii</i> . 358.	
11, 16-18	Costal and Postcostal Areolets.	
1 — 5	Apical Areolets.	
12	Basal Areolets.	
<i>q C n t s</i>	Caudate or Tailed Wing. <i>Ibid</i> , iv. 338, <i>n 3</i> . with Crenate or Scalloped Margin. <i>Ibid</i> , iv. 296, <i>n 10</i> .	

*q D S* Caudate or Tailed Wing, with Sinuate Margin.

*Introduction to Entomology*, iv. 296, n 8.

*x x* Ocellus or Eyelet. *Ibid.* 286-288, n 20-31.

*y y*      **Fascia or Band.**      *Ibid*, 289, 290, n 39, a—g.

ABBREVIATIONS IN THE SYNOPTICAL TABLE.

*b.*   }   Signifies   }   beginning.  
*m.*   }   middle.  
*e.*   }   end.



A  
SYNOPTICAL TABLE  
OF  
BRITISH BUTTERFLIES.

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
PAPILIO	<i>P. Machaon</i>	Swallow-tail	Wild Carrot, Fennel, and other umbel- liferous Plants
	— <i>Podalirius</i>	Scarce Swallow-tail	Almond, Black thorn, Plum, Apple, Pear, and Oak
GONEPTERYX	— <i>Rhamni</i>	Brimstone	Buckthorn
COLIAS	<i>C. Edusa</i> *	Clouded Sul- phur	Diadelphous Plants and Charlock
	— <i>Helice</i>	White-clouded Yellow	Charlock and in Clover-fields
	— <i>Hyale</i>	Pale-clouded Yellow	Diadelphous Plants
	— <i>Chrysopheme</i>	.....	Coronilla varia
PIERIS	<i>P. Crataegi</i>	Black-veined White	White-thorn & Gooseberry
PONTIA	— <i>Brassicae</i>	Large White	Cabbage

\* *C. Europome* is the male of *C. Edusa*.

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
July, Sep.	Fenny Places. Acle and Horning, Norfolk, Cherry-Hinton, Madingley, Whittlesea, and Grandchester, Cambridgeshire, Beverley, York, Bristol, Epping Forest, Westram, and Waltham, Surrey.	<i>e.</i> May and sometimes in August, a second brood	3 7
May	Woods. Bedfordshire, New Forest, (Mr. Hawkins,) Netley, Salop. (Rev. T. W. Hope,) Riddleswood, St. Osyth, Essex.	May, Aug.	3 6
Spring	Woods and Road-sides, in the Meadows nr. Bramford Church, Suffolk, Dartmoor, Devonshire, Navestock, Essex, (Common.)	Spring, <i>b.</i> June and in Autumn	2 6
.....	Meadows and Road-sides, near Ipswich, Suffolk, Dartmoor, Devonshire, Dover, Kent.	<i>m.</i> August	2 3
.....	Gardens and Meadows, Little Chelsea, Clover-fields, and on the Charlock, Ipswich, Suffolk.	<i>m.</i> August	2 3
July	Yorkshire, Kent, Sussex, and Suffolk, chiefly on the sea coast.	<i>m.</i> August	2 2
.....	Norfolk.	.....	.....
Spring	Gardens & Thickets. New Forest, Hampshire, Whittlesea Mere, Navestock, Essex, Coombe Wood, Enborne, Berkshire, and Dorsetshire.	June	2 10
Summer	Gardens.	<i>m.</i> May <i>m.</i> August	2 11

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnæan Name.	English Name.	
PONTIA	<i>P. Rapæ</i>	Small White	Cabbage and Turnip
	— <i>Napi</i>	Green-veined White	Cabbage
	— <i>Daplidice</i>	Green-chequered White	Wild Woad, Base Rocket, Cabbage, Wild Mignonette
	— <i>Cardamines</i> *	Orange-tip	Cuckoo flower, Smooth Tower Mustard, Field Cabbage
	— <i>Sinapis</i> †	White Wood	Mustard, Birds foot Trefoil, and Meadow Vetchling.
	<i>M. Euphroysne</i>	Pearl-bordered Fritillary	Mountain and Dog's Violets
MELITÆA Forelegs spurious. ‡	— <i>Silene</i>	Small Pearl-bordered Fritillary	.....
	— <i>Tesselata</i>	Straw May Fritillary	Plantain
	— <i>Dictynna</i>	Pearl-bordered Likeness	Plantain and Heath

\* *P. Cardamines*, differs in its wings as well as its pupa from the rest.

† *P. Sinapis*, probably will form a distinct genus, Mr. Stephens so considers it.

‡ These are also called *Tippet-legs*, and by the French *Pieds de pelerine*.

Caterpillar when found.	BUTTERFLY.		Expansion In lines.
	Where found.	When found.	
Summer	Gardens.	<i>m.</i> May, <i>m.</i> August	2 2
Summer	Gardens, Woods, and Thickets, Navestock and Purfleet, Essex, (Common.)	<i>m.</i> May, <i>b.</i> July	2 1
.....	White Wood, near Gamlingay, Cambridgeshire, Dover Cliffs, Kent, near Hampstead, Middlesex.	April, May August	1 10
.....	Woods and Lanes, Helmingham, Suffolk, Dartmoor, Devonshire.	<i>c.</i> May	1 11
May and July	Woods. Stour & Hartley Woods, and Bromley Thickets, Essex, Dartmoor, Devonshire.	<i>m.</i> May, <i>b.</i> August	1 8
.....	Heaths and Woods, Stour, Hartley, and Hamlets' Wood, and Bromley Thickets, Essex, Dartmoor, Devonshire, Carlisle, Dartmoor, Kent.	May	1 10
.....	Heaths and Woods, Stour, Hartley, and Hamlets' Wood, and Bromley Thickets, Essex, Dartmoor, Devonshire, Newcastle, and Durham.	May, <i>b.</i> July	1 10
.....	Caen Wood, Middlesex.	<i>b.</i> May	1 9
.....	Heaths and Marshes, Hartley Wood, Essex, Dartmoor, Devonshire, Blackheath, near London.	<i>b.</i> July	1 9

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnæan Name.	English Name.	
MELITÆA Forelegs spurious.	<i>M. Eos</i>	Dark under-winged Fritillary.	.....
	— <i>Cinxia</i>	Glanville Fritillary.	Ribwort, Plantain, Speed-well, Mouse-ear, Hawk-weed.
	— <i>Artemis</i>	Greasy Fritillary.	Devil's-bit Scabious, and Plantain.
	— <i>Lucina</i>	Duke of Burgundy Fritillary.	Grass, Cowslip and Primrose.
ARGYNNIS Forelegs spurious.	<i>A. Paphia</i>	Silver-washed Fritillary.	Dog's Violet, Nettle, and Raspberry.
	— <i>Aglaia</i>	Dark Green Fritillary.	Dog's Violet.
	— <i>Caroletta</i>	Queen of England Fritillary	.....

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
.....	Heaths and Marshes, Middlesex.	b. May	1 8
m. April	Meadows, Pasture upon the edge of a hill near Ryde, Isle of Wight, Dover, Kent, York- shire.	m. June	1 11
m. April	Meadows, near Norwich, Norfolk, Beachamwell, Norfolk, Eris- well, and Mildenhall, Suffolk, Dartmoor, Devonshire, Brighton, and Enborne, Berkshire.	m. May	1 10
.....	Woods and Hedges, near Cam- bridge, Hitchensham, Suffolk, Bromley Thickets, Hartley Wood, Dedham Birch-Woods and High Woods, Blackmoor, Essex, Coombe Wood and Da- reth Wood, Kent, and Carlisle.	e. May and June	1 4
c. May	Woods, Lexden and Stour Woods, Bromley Thickets and Ham- lets' Wood, Hutton's Grove Beaumont, Riddleswood, Mal- don & Thorndon Woods, Essex, Old Hall, Hull and Dodnash Woods, and Bentley, Suffolk, Dartmoor, Devonshire.	b. July	2 11
m. May	Heaths, Nacton Heath, and Bix- ley Decoy, Suffolk, Lexden Heath, Birch Wood near Ded- ham, Bromley Thickets, Wrab- ness Cliff, Thorndon, Navestock and Purfleet, Essex, Dartmoor, Devonshire.	b. July	2 8
.....	Woody Places, Bedfordshire, Rid- dleswood, and St. Osyth's, Essex.	b. July	2 7

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
ARGYNNIS Forelegs spurious.	<i>A. Adippe</i>	High Brown Fritillary.	Dog's Violet, and Heart's-ease.
	— <i>Lathonia</i>	Queen of Spain Fritillary.	Heart's-ease, Saintfoin, Mouse-ear-Hawkweed.
CINTHIA Forelegs spurious.	<i>C. Cardui</i>	Painted Lady.	Spear Thistle, Nettle, Millfoil and Mallow.
VANESSA Forelegs spurious.	<i>V. Atalanta</i>	Red Admiral.	Common Nettle.
	— <i>Io</i>	Peacock.	Common Nettle.
	— <i>Antiope</i>	White-bordered.	Willow, Birch, and Poplar.
	— <i>Polychloros</i>	Wood Large Tortoiseshell.	Elm, Dogwood and on Fruit Trees.
	— <i>Urticæ</i>	Small Tortoiseshell.	Nettle.

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
<i>m.</i> May	Woods, Hintlesham, Old Hall, Hull and Dodnash Woods, Suffolk, Hartley and Hamlets' Wood, and Bromley Thickets, Essex, Dartmoor, Devonshire.	<i>b.</i> July	2 8
.....	Woods, Gamlingay and Wisbeach, Cambridgeshire, near London, Dover Cliffs, on Dandelion in dry Pastures by a Wood in Stoke by Nayland, between Colchester and Sudbury, Suffolk, Ipswich, and in North Wales.	<i>c.</i> May <i>b.</i> Sept.	2 1
<i>m.</i> July, 2nd brood in Sept.	Field-sides and Gardens, Campsey Ash, Suffolk, Gardens near Beacon Cliff, Harwich, Lexden and Wrabness, Navestock and Purfleet, Essex, Neighbourhood of Dartmoor, Devonshire.	Spring <i>c.</i> July	2 7
Spring, <i>b.</i> July	Woods, Hedges, and Gardens, Neighbourhood of Dartmoor, Devonshire.	Spring, <i>m.</i> July, <i>b.</i> August	2 10
<i>b.</i> July	Woods, Fields, and Roads.	Spring, <i>m.</i> July	3 0
Spring	Woods and Road-sides, on the Oak, Little Oakley, Essex, Beccles, Suffolk, near Norwich, Norfolk, New Forest, Hants.	Spring, <i>b.</i> August, <i>m.</i> Sept.	3 8
.....	Roads and Lanes in the Neighbourhood of Elm Trees, Wrabness, Essex, Bentley, Suffolk, Hedge-rows on the Shore of the River Stour, Navestock Walks, and Purfleet, Essex.	<i>m.</i> July	3 0
<i>b.</i> June <i>m.</i> Aug.	Gardens and Way-sides.	Spring, <i>b.</i> July, <i>b.</i> Sept.	2 3

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
VANESSA Forelegs spurious.	<i>C. Album</i>	Comma	Hop, Willow, Gooseberry, Currant, Hazel Nut and Honey Suckle.
APATURA Forelegs spurious.	<i>A. Iris</i>	Purple Emperor	Common Sallow.
LIMENITIS Forelegs spurious.	<i>L. Camilla</i>	White Admiral	Honey Suckle, and the Butter- fly on Bram- ble Blossoms.
HIPPARCHIA Forelegs im- perfect or shorter than the others.	<i>H. Hyperanthus</i>	Ringlet	Grass, at the roots of the Annual Meadow Grass.
	— <i>Davus</i>	Small Ringlet	.....
	— <i>Polydama</i>	Marsh Ringlet	.....
	— <i>Typhon</i>	Scarce Heath	.....
	— <i>Pamphilus</i>	Small Heath	Crested Dog's- tail Grass.
	<i>H. Semele</i>	Grayling	Grass.

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
m. June	Gardens and Thickets, Campsey Ash, Offton, and Ipswich, Suffolk. Lexden and Wrabness, Essex, and Whittlesea Mere, Cambridgeshire.	b. July	2 0
m. August		b. Sept.	
e. May	Woods. On the Oak. Great and Little Stour Woods, Wrabness and Ramsey, Riddleswood, St. Osyths, Essex, Hull, Old Hall, Dodnash, and Raydon Woods, Badley, Suffolk.	b. July	3 2
.....	Woods near Rye, Sussex, New Forest, Hampshire, and Hartley Wood, East Wood and High Woods, near Colchester, Riddleswood, St. Osyths, Essex.	b. July	2 5
.....	Woods. Neighbourhood of Dartmoor, Devonshire, nr. Ipswich, Suffolk, Thorndon Woods, Navestock Hall Walks, and Purfleet, Essex.	e. June	1 10
.....	Marshes near Manchester, Shorn Moor, Yorkshire, Ashdown Forest, Derbyshire.	July	1 5
.....	Marshes, Yorkshire.	June	1 7
.....	Marshes, Yorkshire.	June	1 7
b. May, b. Aug.	Heaths, Pastures, and Way-sides Dartmoor, Devonshire, Navestock Heath and Warley Common, Essex.	b. June b. Sept.	1 4
.....	Heaths and Thickets, Dartmoor, Devonshire, Landguard Common, Rushmere Heath, Martlesham & Nacton Heath, Suffolk, Navestock and Lexden Heaths, and Warley Common, Essex.	m. July	2 5

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
HIPPARCHIA	<i>H. Galatea</i>	Marbled White	Common Cat's Tail Grass.
	— <i>Megæra</i>	Wall	Grass
	— <i>Ægeria</i>	Speckled wood	Couch Grass
	— <i>Hampstediensis</i>	Albin's Hampstead Eye	.....
	— <i>Janira</i> *	Meadow Brown	Smooth stalked Meadow Grass
	— <i>Tithonus</i> †	Large Heath	Annual Meadow Grass
	— <i>Hero</i>	Scarce Meadow Brown	.....
	— <i>Ligea</i>	.....	.....
	— <i>Mnemon</i>	.....	.....
	— <i>Alcyone</i>	.....	.....

\* *H. Jurtina* is the male of this species.

† *Papilio Pilosella* of many authors, which feeds on the Mouse-ear Hawkweed, (*Hieracium pilosella*) is *Melitaea Cinxia* of Linnaeus, according to Ochsenheimer. *P. Pilosella* of Fabricius is synonymous with *P. Tithonus* of Linnaeus, and like the other *Hipparchia* feeds upon grass. (Sepp. I. i. t. iii.)

Caterpillar when found.	BUTTERFLY,		Expansion In. lines.
	Where found.	When found.	
.....	Moist Woods, Mersey Island, Stour and Hartley Woods, Purfleet, Riddleswood and Maldon, Essex, Little Blakenham Chalk Pits, Suffolk, Dartmoor, Devonshire.	b. July	2 2
b. May b. August	Woods and Way-sides.	Spring, b. July, b. Aug.	1 10
March, May, June	Woods. Woods near Bayham Hall, and in the Lanes near the Race Ground, Ipswich, Suffolk, Neighbourhood of Dartmoor, Devonshire, Navestock, Thordon, and Purfleet, and Hainault Forest, Essex.	b. April, b. June, b. Aug.	1 10
.....	Hampstead, Middlesex.		
.....	Meadows and Woods, Barham, Orwell Park, Naeton, and Boughton, Ipswich, Suffolk.	b. June	2 0
b. June	Woods, Pastures, and Commons, Navestock Heath.	m. July	1 8
.....	Ashdown Forest.	June and July	
.....	Isle of Arran, Scotland.		
.....	Between Ambleside and Windermere, Cumberland.		
.....	Scotland.		

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnæan Name.	English Name.	
HIPPARCHIA	<i>H. Blandina</i> — Antennæ gradually clavated.	Scotch Ringlet	.....
THECLA	<i>T. Betulae</i>  — <i>Pruni</i>  — <i>Quercus</i> — Antennæ abruptly clavated.	Brown Hair-streak.  Black Hair-streak.  Purple Hair-streak.	Birch, Black-thorn, & Plum  Plum Tree and Blackthorn  Oak
	— <i>Rubi</i>	Green Hair-streak.	Bramble, Dyer's Weed, Saintfoin, Broom, and Wood Spurge
LYCENA	<i>L. Hippothoe</i> *	Large Copper	Dock
	— <i>Virgaureæ</i>	Middle Copper	Wild Golden-Rod, Sharp Dock.
	— <i>Chryseis</i>	Purple-edged Copper.	.....
	— <i>Phœus</i>	Com. Copper.	Sorrel.

\* *Papilio Hippothoe* of Linnaeus is synonymous with *P. Dispar* of Haworth, &c.

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
	Isle of Arran, Dumfrieshire, Roxburghshire, and near Edinburgh, Scotland, Castle Eden, and near Newcastle.		
c. June	Birch Woods, near Ipswich, Polstead, Suffolk, in Raydon Wood on low Blackthorns, near Dartmoor, Devonshire, Navestock Hall Walks, and Thorndon Woods, Essex.	m. August	1 6
b. July	Gardens and Hedges, Ramsey, and Wrabness, Essex.	c. June	1 5
b. June	Tops of Oak and Ash Trees, Ramsey, Wrabness, & Bromley Thickets, Navestock Walks, Essex, Neighbourhood of Dartmoor, Devonshire.	m. July	1 5
Spring b. July	Hedges and Brambles, Bromley Thickets, and Mr. Hamley's Wood, near thereto on Wood Spurge, near Dartmoor, Devonshire, Great Bentley, Wrabness and Navestock, Essex.	e. May b. June b. August	1 3
	Reedy Marshes, Bardolph Fenn, Norfolk, Whittlesea Mere, Cambridgeshire, & Benacre, Suffolk	c. July b. July	1 3
	Marshes on the Common Golden-Rod, Isle of Ely, and Huntingdonshire.	e. August,	1 6
	Marshes, Epping Forest, Essex, Ashdownham, Sussex.	Autumn	1 5
	Commons, Pastures and Field-sides, Dartmoor, Devonshire, Rushmere Heath, Suffolk, Chigwell, Navestock Heath & Walks, Essex.	b. April, b. June, b. August	1 4

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
POLYOMMATUS	<i>P. Arion</i>	Large Blue.	.....
	— <i>Corydon</i>	Chalk-hill Blue.	Wild Thyme
	— <i>Adonis</i>	Clifden Blue.	Clover
	— <i>Dorylas</i>	Common Blue.	Grass ,
	— <i>Argus</i>	Silver-studded Blue.	Melilot, Broom and Saintfoin
	— <i>Idas</i>	Brown Argus.	Grass
	— <i>Artaxerxes</i>	Scotch Argus.	.....
	— <i>Argiolus</i>	Azure Blue.	Buckthorn

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
.....	Commons, Broomham, Bedfordshire, and Dover Cliffs, Kent, Rocky Situations in North Wales, on Bramble Blossoms, and Llanberries, near Snowdon.	b. July	1 7
.....	Chalk-pits, Little Blakenham, Moulton and Eriswell, Suffolk, Purfleet, Essex, and Brighton, Sussex.	b. July	1 6
.....	Chalky Soils, Dover Cliffs, Kent, Moulton and Dalham, Suffolk, and Purfleet, Essex.	e. May m. August	1 5
e. April e. July	Pastures, Eriswell, Suffolk, Dartmoor, Devonshire, Navestock, Essex.	e. May, e. August	1 4
e. April	Commons, Fields, and Marshes, Bixley Decoy, Nacton, Suffolk, Navestock Heath, and Warley Common, Essex.	m. July	1 3
e. April e. June	Fields, near Norwich, Little Blakenham, about Bixley Decoy, Race-ground and Neighbourhood of Ipswich, near the Shore from Landguard Fort to Sir S. Fludyer's, Suffolk, Wrabness, Lawn of the Parsonage and Cliffs, Essex, Dartmoor, Devonshire.		
.....	Meadows, Arthur's Seat, Edinburgh, Pentland Hills, Fifeshire and Dumfrieshire, Scotland.	e. July	1 1
.....	Woody Places and Meadows, Dartmoor, Devonshire, Dartford Heath, Kent, Brandon Warren, Suffolk, Mundford, Norfolk, Navestock, Essex, and Castle Eden, Durham.	m. May, e. Aug.	1 5

Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
POLYOMMATUS	<i>P. Cymon</i>	Mazarine Blue.	.....
	— <i>Alsus</i>	Small Blue.	.....
	— <i>Thesstylis</i>		.....
	— <i>Lacon</i>		.....
	— <i>Calæthis</i>		.....
HESPERIA	Antennæ ending in a very abrupt acute hook.		
	<i>H. Comma</i>	Silver-spotted Skipper.	Some Diadelphous Plants?
	— <i>Sylvanus</i>	Large Skipper.	.....
	Antennæ with straight knob.		
	— <i>Paniscus</i>	Chequered Skipper.	Greater Plantain
	— <i>Linea</i> *	Small Skipper.	Mountain Hair Grass
	— <i>Tuges</i>	Dingy Skipper.	Field Eryngo, Birds'-foot Lotus.
	Antennæ knob arcuate.		
	— <i>Malveæ</i>	Mallow or Grizzled Skipper.	Mallow
	— <i>Lavateræ</i>	Scarce Grizzled Skipper.	.....

\* *H. Linea* and *Thaumas* are the same species, though considered as distinct by some authors.

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
	Chalky Soils, Norfolk, Yorkshire, and Sherborne, Dorsetshire.	<i>m.</i> May <i>c.</i> July	1 4
	Fields, South Creek, Norfolk, Brandon Warren, Suffolk, Dart- moor, Devonshire, Navestock, and Warley, Essex.	<i>e.</i> May <i>b.</i> July	1 0
	Near Ipswich, Suffolk	June	
	Chalky Soils, near Lewes, Sussex.	<i>e.</i> Aug.	1 3
	Woods, Neighbourhood of Dart- moor, Devonshire, Navestock and Thorndon Woods, Essex.	<i>e.</i> May <i>e.</i> July	1 4
	Meadows and Woody Places, near Bedford, Navestock, Essex, near Dartmoor, Devonshire.	<i>e.</i> May	1 3
	Margins of Woods, Navestock and Thorndon Woods, Essex.	<i>m.</i> July	1 2
	Dry Heaths, Banks, Woods, and Commons, Hintlesham, Suffolk, in Norfolk, and near London, Dartmoor, Devonshire.	<i>b.</i> May	1 3
	Dry Banks, Woods, and Com- mons, Hartley Wood, Nave- stock Heath and Hall Walks, Essex.	<i>e.</i> May.	1 1
	Commons.	<i>e.</i> May	1 1

Ascertained British Species,			
Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnæan Name.	English Name.	
COLIAS	<i>C. Chrysostome</i>		
	— <i>Europome</i> Esper?		
PONTIA	<i>P. Nelo</i>		
	— <i>Napeæ</i>		
MELITÆA	<i>M. Pyronia</i>		
HIPPARCHIA	<i>H. Mnestra</i>		
	— <i>Iphis</i>		
	— <i>Arcanius</i>		
THECLA	<i>T. Spini</i>		
LYCENA	<i>L. Dispar</i>		
POLYOMMATUS	<i>P. Acis</i>		
	— <i>Agrestis</i>		
	— <i>Alexis</i>		
	— <i>Alcon</i>		
	— <i>Eros</i>		
	— <i>Icarius</i>		

*according to Mr. Stephens.*

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	

Doubtful Species of British Butterflies.			
Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnæan Name.	English Name.	
COLIAS	<i>C. Palæno</i>		
DORITIS	<i>D. Apollo</i>		
	<i>D. Mnemosyne</i>		
MELITÆA	<i>M. Dia</i>		
	— <i>Maturna</i>		
ARGYNNIS	<i>A. Niobe</i>		
VANESSA	<i>V. Levana</i>		
LIMENITIS	<i>L. Populi</i>		
	— <i>Sibilla</i>		
HIPPARCHIA	<i>H. Phædra</i>		
	— <i>Mæra</i>		
POLYOMMATUS	<i>P. Titus</i>		

*according to Mr. Stephens.*

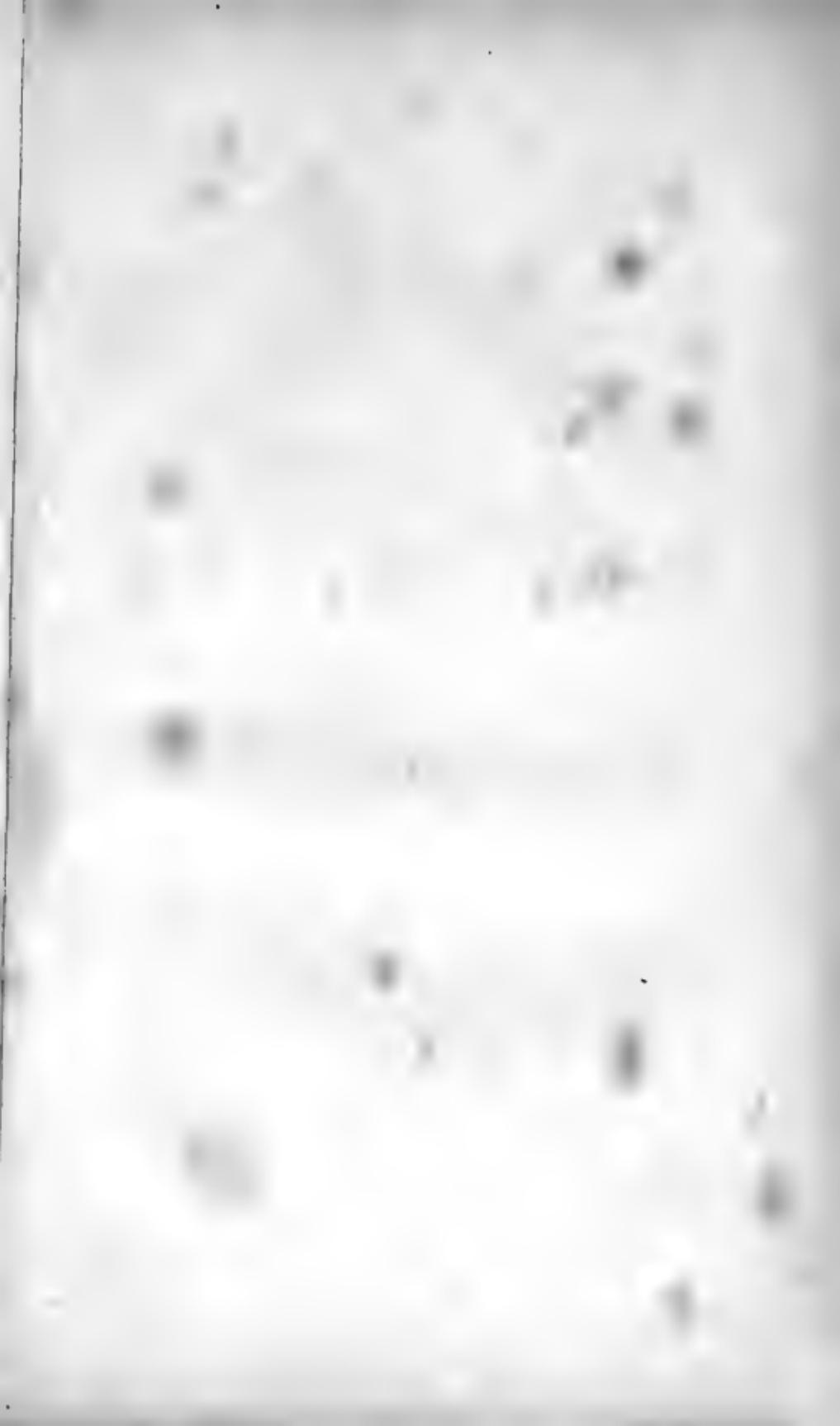
Caterpillar when found.	BUTTERFLY.		
	Where found.	When found.	Expansion In. lines.

Ascertained British Species,			
Genera.	BUTTERFLY.		Caterpillar feeds upon.
	Linnaean Name.	English Name.	
PONTIA	<i>P. Chariclea</i>	Early White	.....
	— <i>Metra</i>	Howard's White.	.....
	— <i>Sabellicea</i>	Dusky-veined White.	.....
PARNASSIUS	<i>P. Apollo</i>	Apollo.	Orpine and Saxifrage
HIPPARCHIA	<i>H. Cassiope</i>	Mountain Ringlet.	.....
THECLA	<i>W. Album</i>	White-letter Hair Streak.	Elm and Blackthorn
LYCENA	<i>L. Dispar</i>	Large Copper	Dock
	— <i>Hippothoe</i>	Dark Under-wing.	.....
POLYOMMATUS	<i>P. Acis</i>	Mazarine Blue	.....
	— <i>Alcon</i>	Alcon Blue.	.....
	— <i>Agestis</i>	Brown Argus	.....
	— <i>Salmacis</i>	Durham Argus	.....

*According to Mr. Duncan.*

Caterpillar when found.	BUTTERFLY.		Expansion In. lines.
	Where found.	When found.	
.....	Hertfordshire and Derbyshire.	May and June	
.....	South of England.	April and 2nd brood in June	20 to 25
.....	Near London, also near Newcastle.		
.....	Island of Lewis in the Hebrides.		3 ...
.....	Cumberland and Westmoreland.		... 16
.....	Ripley.	July	
.....	Whittlesea Mere, Yaxley, Suffolk	July and August	13 to 14
.....	Marshy Places, Kent.		15 to 17
.....	Norfolk, Dorset, Yorkshire, Surry and Cambridgeshire.		
.....	Buckinghamshire.		
.....	Sussex, Kent, Dorset, and Somersetshire.	June and August	1 ...
.....	Castle-Eden and Durham.	July	





3 Colias Elesia



2 Gonepteryx Rhamni



1 Papilio Machaon



5 Pontia Brassicae



6 Melitaea Artemis

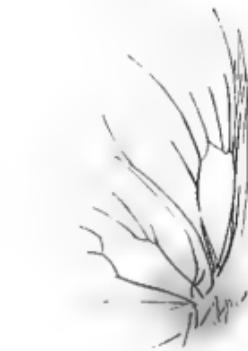
7. *Argynnis Aglaja.*



1. *Pieris Crataegi.*



9. *Apatura Iris.*



11. *Hipparchia Galatea.*



8. *Vanessa Io.*



11 *Polyommatus Corydon*



13 *Evagora Hippothoe*



10 *Limenitis Camilla*



15 *Hesperia comma*



15 *Hesperia sylvanus*



12 *Thecla Quercus*



## DESCRIPTION OF THE BUTTERFLIES

ENUMERATED IN THE SYNOPTICAL TABLE,

*With Authorities and References to Works where they are  
figured, and Observations on their Habits, &c.*

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### Genus PAPILIO, Plate I. Fig. 1.

*Antennæ* long, with a tapering curved knob: joints more than thirty.

*Palpi* short, not extending beyond the head.

*Forelegs* perfect: *cubit* armed in the middle with a lance shaped spur; shanks with two spurs each at the tip.\*

*Claws* simple, without foot cushions.†

*Primary Wings* intire, triangular.

*Secondary* roundish, scalloped, often tailed.

*Egg* unknown.

*Caterpillar* naked, with a Y-shaped scent-organ issuing from its neck when alarmed.

*Chrysalis* angular, girted,‡ head-case eared.§

*Sepp.* I. ii. pl. iii.

\* Introduction to Entomology, iii. 369, d. 384, e. N. B. All Butterflies have shanks with two spurs each.

† Ibid. 386, a.

‡ Suspended by a single thread round its body.

§ That is called an *eared* head-case, which terminates in a pair of processes somewhat resembling ears.

## PAPILIO MACHAON, SWALLOW-TAIL.

*Lewin*,\* *pl. 34.* *Donovan*,† *v. 6, p. 211.* *Duncan*,‡ *pl. 4, fig. 1.*

*Butterfly.* Wings yellow and black; the black being also powdered with yellow. Primary with a row of yellow crescents at the posterior margin. Secondary, tailed, indented, with a double row of crescents at the posterior margin, the interior ones blue, the exterior yellow. Anal angle with an eye-like red spot surmounted by a blue crescent, and surrounded by a black iris. Wings underneath paler, variegated with black and grey, and two or more red spots, one at each of the posterior angles.

*Caterpillar.* Smooth, of a lovely pale green above, underneath shading into a fine bottle-blue, striped with black transverse rings or bands, on which are dots of orange red. This species is furnished with a remarkable y-shaped scent-organ, which is situated at the anterior margin at the back of the first segment, close to the head. It secretes an acrid liquor, which emits an unpleasant smell, particularly when the animal is irritated, by which it keeps the ichneumons at a distance. At the bottom it is simple, but divides towards the middle into two forks, of a fleshy substance, which it can lengthen as a snail does its horns, to five times their ordinary extent, or retract them within the stalk, so as wholly to conceal them, leaving only two tawny-coloured dots to mark their existence. It is solitary, and feeds principally on umbelliferous plants.

*Chrysalis.* Of a yellowish green and grey, beset with many points of a whitish hue, with a longitudinal black band on each side.

\* *Lewin's English Butterflies.*

† *Donovan's History of British Insects.*

‡ *Duncan's British Butterflies.*

*Observation.* This is the largest and one of the most beautiful Butterflies which Britain produces, and may be considered as the only British species excepting the *P. Podalirius*, (which in England is extremely rare), belonging to Linne's tribe of *Equites*. When first discovered it was supposed to be a foreign insect. By some English Aurelians it has been denominated the Royal William, probably in compliment to his Royal Highness William Duke of Cumberland, who in 1745, (which was about the time that this Butterfly was first noticed,) was very popular for his defeat of the rebels. In some districts in France it is known by the name *Grand Carottier*, from the injury it occasions to the carrot in the cultivated as well as the wild state. This splendid insect though called the Common Swallow-tail Butterfly, is only to be met with in particular places, and is by no means abundant in any part of England. It sometimes happens that two broods of this Butterfly are produced in the same summer, one in May, having been in the pupa state all the winter, the other in August, from the *Chrysalides* of July. If the Caterpillar of *P. Machaon* becomes a pupa in July, the Butterfly will appear in thirteen days; if in September, not till June following.

#### PAPILIO PODALIRIUS, SCARCE SWALLOW-TAIL.

*Lewin*, pl. 35. *Donovan*, v. 4, p. 109. *Duncan*, pl. 4, fig. 2.

*Butterfly.* Wings yellowish. Primary with the costal nervure, six bands (the two first extending into the secondary wing, and the third and fifth much abbreviated,) and the posterior margin black. Secondary tailed, indented, with posterior margin black with four purplish crescents, a spurious eyelet at the anal angle, black with a purplish crescent, and

surmounted by a tawny spot. Below, several narrow black bands, the intermediate pair being approximated and parallel. Posterior margin black, near the anal angle powdered with yellow. Eyelet as above. In the primary wings below, the fourth and sixth bands inclose an ash coloured one.

*Caterpillar.* Solitary,\* smooth, yellowish green dotted with three longitudinal lines of a whitish yellow on the back and sides, and obliquely streaked with the same colour. The head protrudes two retractile horns.†

*Chrysalis.* Yellow, beset with many points of a dull brown.

*Observation.* The latter end of May, or the beginning of June, is the usual time of this Butterfly being hatched. Mr. Haworth says, "in all probability *Podalirious* is double brooded, like the kindred species *Machaon*; and if so it must be in the *larva* state in this country in June, and again in September; and in the *imago* state in the corresponding months of May and August." It is very common in France under the name of *Le Flambe*, from a supposed resemblance in the pyramidal shape of the black stripes to the form of flames. There are many notices of this very rare insect having been captured in England; it is mentioned as a native by Ray and Berkenhout, and figured as such by Donovan, Lewin, and others; yet on strict investigation, it still remains rather doubtful if really indigenous. It is stated to have been taken by Mr. Hawkins,‡ in the New Forest, in 1827, and more recently on the authority of the Rev. F. W. Hope,§ at Netley, Salop.

\* Ochsenheimer's Schmetterlinge von Europa.

† This if fully protruded would probably be found to be the Y-shaped *osmaterium* or scent-organ observable in *P. Machaon* and the other Caterpillars of the genus. (See Introduction to Entomology, ii. 244, iii. 148.)

‡ Vide Ingpen's Instructions, page 91.

§ Vide Duncan's British Butterflies, page 99.

*Genus GONEPTERYX, pl. I, fig. 2.*

*Antennæ* rather short, with a tapering rather compressed obscure knob ; joints less than thirty.

*Palpi* longer than the head.

*Forelegs* perfect ; *cubit* unarmed.

*Claws* short, bifid, without foot cushions.

*Wings* angular ; *primary* rather falcated subtriangular, with a slight bay in the anterior margin ; *secondary* between ovate and wedge-shaped, internally forming a grove to receive the abdomen.

*Egg* unknown.

*Caterpillar* naked.

*Chrysalis* subangular, hunched, suspended and also loosely girted ; head-case beaked.\*

*De Geer* 1. pl. xv. fig. 1, 2.

*Hübner Schmet.* pl. lxxxviii. c. d.

**GONEPTERYX RHAMNI, BRIMSTONE.**

*Lewin*, pl. 31. *Donovan*, v. 5, p. 145. *Duncan*, pl. 5, fig. 1.

*Butterfly.* Wings brimstone-coloured, each with a dot above yellow, below ferruginous, the margins, especially the costal, dotted with ferruginous. Underneath greenish. The female differs from the male in the wings on both sides, being paler or approaching to greenish white. N. B. The wings are sometimes altogether of a pale green.

*Caterpillar.* Pale green, with black dots on the back, brighter in the sides, with a faint white lateral stripe.

*Chrysalis.* Greenish with two bright yellow stripes on the sides.

\* The beaked head-case terminates in a *single* process.

*Observation.* This is one of the earliest of our vernal Butterflies, and frequently even in the chilly and uncertain months of March and April is to be seen in our shrubberies and gardens, where its beautiful colour and graceful form render it an object of great attraction. The eggs which it deposits in the spring, appear as a second brood of Butterflies in August; these sometimes continue dormant through the winter. It also hibernates in the pupa state. The Butterfly is often found on *Melica uniflora* (Wood Melic Grass). Mr. Curtis in his elegant work of "British Entomology," pl. 173, has figured a beautiful variety of this insect, of a deep clouded yellow, dotted and streaked with orange, which was taken at Peckham, in Surry, and is now in the cabinet of Mr. Haworth.

*Genus COLIAS, pl. I, fig. 3.*

*Antennæ* rather short, with a tapering but thickish obtuse knob; joints less than thirty.

*Palpi* protracted beyond the head.

*Forelegs* perfect, cubit unarmed.

*Claws* bifid; without foot cushions.

*Wings* intire; *primary* triangular; *secondary* rounded, internally forming a grove to receive the abdomen.

*Egg* unknown.

*Caterpillar* naked, tuberculated.

*Chrysalis* subangular, hunched, girted, head-case beaked with a long beak.

*Merian* Surinam; *Hilbner Schmet.* pl. Iviii. c. d.

**COLIAS EDUSA, CLOUDED SULPHUR.**

*Lewin*, pl. 32. *Donovan*, v. 7, p. 238. *Duncan*, pl. 5, fig. 2.

*Butterfly.* The primary wings of the male, above, of a pale orange colour, the central spot, and posterior margin

broadly black brown; underneath, the disk of a very pale tawny orange colour, greenish at the tip; the middle spot black, and a series of black spots, the anterior ones obliterated in the posterior part of the wing. The secondary wings above, pale orange, with a narrow black fringe or margin; with a central spot scarcely discernible of a deeper orange, and blackening at the inner sides; a ferruginous oblong spot in the middle of the anterior margin, and a series of dark points mark the posterior part of the wing. Underneath greenish with a central sesquialterous eyelet, with another near it, with a silver pupil and ferruginous iris. The female differs from the male, in having above, a series of yellow spots on the black fringe, and underneath, in five black spots or dots in the primary wing, and a series of faint ferruginous dots in the posterior parts of the secondary wings.

*Caterpillar.* Of a dull green with a white longitudinal stripe on each side, dotted with yellow and blue.

*Chrysalis.* Green, with yellow lateral stripes. Wing-sheath marked with black lines.

*Observation.* Mr. Duncan states that it seems to prefer the vicinity of the sea, but it is also found in the midland counties.

#### COLIAS HELICE, WHITE CLOUDED YELLOW.

*Lewin, pl. 33, f. 3, 4.*

*Butterfly.* The disk of the primary wings unequally white, with the base blackening a little; a middle spot and unequal broad fringe or margin black, in the fringe one or two white spots; underneath almost similar to the female of *C. Edusa*, but the disk is white, instead of pale orange. The secondary wings above, whitish, the middle spot tawny orange, and the

margin black, in which on the inner side are one or two white spots scarcely visible; underneath nearly like the female of *C. Edusa*, but yellower.

*Observation.* "Having at length," says Mr. Haworth, "found five perfect specimens of this fine *Papilio*, in five different cabinets, (all of which were taken in England, and agree exactly with each other in every respect.) I now give it as a distinct species, and not as a variety of *Edusa* only, which it has hitherto in this country been conceived to be. And in this I have the happiness to be supported by the elegant work of Hübner, whose denomination of this species, *Helice*, I have with due deference preserved; though previous to the possession of that author's *Schmet* I had determined it to be distinct, and in my MS. as in the *Prodromus* called it *Edusa alba*."

#### COLIAS HYALE, PALE CLOUDED YELLOW.

*Lewin*, pl. 33, f. 1, 2. *Donovan*, v. 2, p. 43. *Duncan*, pl. 6, fig. 1.

*Butterfly.* Very like *Colias Palæno*, but the wings yellower, fringe reddish. Primary wings pale yellow, black at the tip, the blackness being as it were divided into two parts by a yellow band consisting of spots. Underneath dirty yellow, with a black central spot and a series of blackish dots within the margin. Secondary wings with a central ferruginous spot, and a black margin. Underneath dirty yellow, with a sesquialterous eyelet, iris ferruginous, pupil silver; a larger spot of the anterior margin, and a series of spots near the anterior one ferruginous.

*Caterpillar.* Green, silky, with a lateral white longitudinal stripe, dotted with yellow.

*Chrysalis.* Green with a yellow lateral longitudinal stripe.

*Observation.* This Butterfly is much rarer than *Edusa*, but like that, is chiefly found on the sea coast.

COLIAS CHRYSOTHOME. . . . .

*Butterfly.* Wings yellow, with the anterior margin brown, in the male interrupted by yellow veins, in the female by yellow spots; underneath with six marginal spots. The ground colour is citron yellow, in the middle reddish yellow.

*Caterpillar.*

*Chrysalis.*

*Observation.* This insect, on the authority of Mr. Stephens, is now classed as a distinct British species, and as such will be included among the *Papilionidæ* in his elegant "Illustrations of British Entomology."

Genus PIERIS, pl. II, fig. 4.

*Antennæ* rather long, with a tapering short obtuse knob; joints more than thirty.

*Palpi* porrected beyond the head.

*Forelegs* perfect; cubit unarmed.

*Claws* very short, bifid, with foot cushions.

*Wings* intire; *primary* subtriangular; *secondary* between wedge-shaped and ovate.

*Egg* unknown.

*Caterpillar* subfusiform, hairy, subtuberculated.

*Chrysalis* angular, girted; head-case beaked with an obtuse beak.

*De Geer* i. pl. xiv. fig. 13—19.

*Hübner Schmet.* pl. lxxix. c. a. b.

PIERIS CRATÆGI, BLACK-VEINED WHITE.

*Lewin*, pl. 24. *Donovan*, v. 13, p. 454. *Duncan*, pl. 9, fig. 2.

*Butterfly.* All the wings on both sides white, with black margins and nervures. The primary ones marked with

about six small triangular spots, blackening at the posterior margin.

*Caterpillar.* Velvety black, with short white and tawny hairs, the last forming on each side of the body a line of the same colour.

*Chrysalis.* Lemon colour, sometimes whitish with numerous black spots and streaks.

*Observation.* The larvæ of *P. Cratægi*, enclose themselves in the autumn in cases of silk, and thus pass the cold season in small societies of from two to twelve, under a covering formed of leaves. When first excluded, they devour the shells of the eggs from which they have proceeded. The female is very prolific, and covers her eggs which she deposits on the extremity of a hawthorn branch, with a coating of varnish so effectually weather-proof, that they remain in security till the larvæ are excluded. The Butterfly of this species as well as of *Vanessa Urticæ* and *Polychloros*, emits a fluid of a reddish colour, which has frequently given rise to the reports of showers of blood which are said to have fallen in different places. This species is stated to have disappeared from the neighbourhood of London for many years.

*Genus PONTIA, pl. I, fig. 5.*

*Antennæ* slender, long, with a short abrupt grooved \* knob ; joints more than thirty.

*Palpi* porrected beyond the head.

*Forelegs* perfect ; cubit unarmed.

*Claws* very short, bifid ; with short foot cushions.

*Wings* nearly as in *Pieris*.†

*Egg* ovate, acuminate, many ridged.

\* In *Pontia Cardamines* the groove runs the whole length of the antennæ, and the palpi are much longer.

† In *Pontia Sinapis* the wings are very narrow, wedge-shaped, and rounded at the tip.

*Caterpillar* subfusciform, downy, sometimes tuberculated.  
*Chrysalis* angular, girted, head-case beaked with a sharp beak.  
*Sepp.* I. ii. pl. I. ii. iv.

### PONTIA BRASSICÆ, LARGE WHITE.

*Lewin*, pl. 25. *Donovan*, v. 13, p. 446. *Duncan*, pl. 7, fig. 2.

*Butterfly*. The wings above white, the primary ones of the male black at the tip, those of the female with the tip, two round spots behind the middle, and a club-shaped spot at the interior margin all black. Primary wings in both sexes white, underneath often cinereous at the base, with yellowish tips and two irregular black spots in the disk. Secondary ones, below, pale yellow powdered with black, and sometimes an obsolete black spot.

*Caterpillar*. Greenish, with many small black tubercles, and three pale yellow longitudinal stripes; tail black.

*Chrysalis*. Pale green, dotted with black.

*Observation*. The female *Butterfly* of this species, and probably of most others, possesses a pair of ovate *Colleteria* or varnish secretors, filled with a yellow fluid, which entomologists suppose is used for gumming the eggs to the leaves on which they are deposited, and as a varnish in the construction of their cocoons. It may probably serve also for other purposes. This is the common large white or cabbage *Butterfly*, so abundant in our gardens. It takes its name from the plant on which it feeds, and to which it is so fatal. "The larva of this and the following species," says Haworth, "multiply so much in dry seasons, as to make great havoc among our cabbages, &c. Small birds destroy incredible numbers of them as food, and should be encouraged. I once

observed a Titmouse (*Parus Major*) take five or six large ones to its nest in a very few minutes. In enclosed gardens Sea-gulls, with their wings cut, are of infinite service. I had one eight years, which was killed by accident, that lived entirely all the while upon the insects, slugs, and worms he found in the garden. Poultry of any sort will soon clear a small piece of ground ; but unless they are of the web-footed kind, they do much damage by scratching the earth." It is the general custom of gardeners to collect and destroy these Caterpillars with great care. The time of the female Butterfly laying her eggs lasts but a few days, if the plants were at that time watched, it would be easy to take them by the help of the net. The numbers of the parent insect who live out the winter being very few. Bonnet states that the pupæ of *P. Brassicæ* exposed to a frost of 14° R. below zero (0.° F.) became lumps of ice, and yet produced Butterflies.

#### PONTIA RAPÆ, SMALL WHITE.

*Lewin, pl. 26. Duncan, pl. 7, fig. 3.*

*Butterfly.* Very much like *P. Brassicæ*, but the spots are completely separate ; it differs also in being twice as small, and in having a different larva. It varies in the spot of the tip, which is sometimes blackish and occasionally cinereous, but always nearer to the costal nervure than in the preceding, to which in other respects it is exactly similar.

*Caterpillar.* Green, with a brass-coloured dorsal narrow longitudinal stripe, and sides beset with brass-coloured points.

*Chrysalis.* Inclining to green, with three greenish-yellow narrow longitudinal stripes.

*Observation.* The female of *P. Rape* is so much like the same sex of *P. Brassicæ* that it might be taken for a variety of it, did not the marked difference of the respective Caterpillars evince the complete distinction of these Butterflies.

### PONTIA NAPI, GREEN-VEINED WHITE.

*Lewin*, pl. 27. *Donovan*, v. 8, p. 280. *Duncan*, pl. 9, fig. 1.

*Butterfly.* Very much like *P. Rape* in size and characters, but very different in the nervures, (particularly of the secondary wings), being marked by a dilated greenish line.

*Variety 1.* The primary wings of the male, white, with a posterior spot and the tip black; of the female with two posterior spots and tip black. Underneath, in both sexes, with nervures faint green, the secondary wings with nervures greenish, with the colour dilated at their base.

*Variety 2.* The primary wings of the male, white, without spots, the tip slightly black; of the female as in *Variety 1.* but the base and nervures rather ash-coloured, inclining to white at the tip. The vein-like lines, in both sexes, more dilated throughout than in *Variety 1.* The under wings vary in both, they are sometimes whitish, and sometimes yellow or yellowish.

*Caterpillar.* Dull green, lighter on the sides with yellow stigmata, and covered with white warts, which are blackish at the tip.

*Chrysalis.* Greenish yellow, angles very acute and prominent.

### PONTIA DAPLIDICE, GREEN-CHEQUERED WHITE.

*Lewin*, pl. 28. *Donovan*, v. 6, p. 200. *Duncan*, pl. 9, fig. 2.

*Butterfly.* A little larger than *P. Cardamines*. The primary wings white, two brown spots on both sides of the disk

of the female, but of the male, only one above; the tips brown with some scattered white spots, of the same colour underneath, but instead of brown they are greenish. The secondary wings of the male above are white, and without spots; of the female, with the circumference brownish and spotted with white. Underneath white, and spotted with greenish.

*Caterpillar.* Head bright green with yellow bands and black dots; the body dirty blue, striped with yellow with black dots.

*Chrysalis.* Like that of *C. Napi*, is green, but afterwards becomes brownish or grey.

*Observation.* Although recorded from a remote period as a native of Britain, this insect still continues to be classed among our rarest kinds. It is by many called the Bath White Butterfly.

#### — CARDAMINES, ORANGE TIP.

*Lewin*, pl. 30. *Donovan*, v. 5, p. 169. *Duncan*, pl. 10, fig. 1, 2.

*Butterfly.* The primary wings of the male white, the base, central point, and tip black; the latter has also a series of white marginal dots, and a large saffron-coloured spot on both sides. The secondary wings white, with seven black points at the posterior margin, underneath marbled with green. The wings of the female are the same on both sides as the male, but the tip is more black and entirely without the saffron-coloured spot.

*Caterpillar.* Solitary, green above and underneath whitish.

*Chrysalis.* Green, with a white narrow longitudinal stripe on both sides.

*Observation.* This is the Wood-lady of the London fly-

fanciers, and though common all over England, is one of our prettiest British insects.

— SINAPIS, WHITE WOOD.

*Lewin*, pl. 29, f. 4, 5. *Donovan*, v. 8, p. 280. *Duncan*, pl. 10, fig. 3.

*Butterfly*. The wings above white, but somewhat cinereous at the base, with a great round brownish spot at the tip; the tip itself whitish. The secondary wings underneath with dull brown transverse bands scarcely discernible. The female has no spot at the tip.

*Caterpillar*. Green, with a deep yellow longitudinal stripe on each side.

*Chrysalis*.

*Observation*. It is the smallest of our white Butterflies, and, except in certain places, rather scarce in Britain. The wings of this species are narrow, shaped somewhat like those of a *Libellula*. Mr. Stephens in his table of *Papilionidae*\* appears to consider this, and with reason, as belonging to a distinct genus, which he calls *Leucophasia*.

Genus MELITÆA, pl. I. fig. 6.

*Antennæ* with a very abrupt, short but large obtuse knob; joints thirty or more.

*Palpi* longer than the head, very hairy.

*Forelegs* small, but perfect.

*Claws* double, with a short foot cushion.

*Wings* intire; *primary* triangular; *secondary* between round and triangular, rather grooved to receive the abdomen.

*Egg* unknown.

\* Illustrations of British Entomology, No. ii. *Lepidoptera*, p. 6.

*Caterpillar* spinose, pubescent.

*Chrysalis* subangular suspended ; head-case rounded.

*De Geer* ii. pl. i. fig. 10, 18.

*Hübner Schmet.* pl. i. A. a.

#### MELITÆA EUPHROSYNE, PEARL-BORDERED FRITILLARY.

*Lewin*, pl. 13, 42. *Donovan*, v. 9, p. 312. *Duncan*, pl. 15, fig. 2.

*Butterfly.* All the wings above, tawny orange, with numerous black spots, the spots nearly forming a band. Primary, underneath paler, with black waved spots. Secondary, underneath ferruginous, red at the base with one small silver spot and a small eyelet with a black pupil and a yellowish iris, then an irregular band of yellowish spots, in which is a large wedge-shaped silver spot, between this band and the posterior margin ; below, an almost obscure ferruginous band clouded with yellow, in which are obsolete darkish subocellated spots, and lastly seven nearly triangular silver spots in the margin.

*Caterpillar.* Black and spiny, with dotted lines of orange on the back.

*Chrysalis.*

#### MELITÆ SILENE, SMALL PEARL-BORDERED FRITILLARY.

*Lewin*, pl. 13, f. 3, 4. *Duncan*, pl. 13, fig. 3.

*Butterfly.* Altogether similar to the preceding, but apparently distinct. It differs principally in a separate point or dot underneath the base of the secondary wing, a silver spot

in the anal angle, and in others opposite the exterior margin, and lastly in two large brown posterior spots, and these in a streak consisting of distinct black dots.

*Caterpillar.* Black, with a conspicuous clear lateral stripe, spines half yellow.

*Chrysalis.*

*Observation.* This is *P. Euphrasia* of Lewin.

MELITÆA TESSELLATA, STRAW MAY  
FRITILLARY.

*Petiver, Pap. Brit. pl. 1, tab. 3. f. 11, 12.*

*Butterfly.* In size and shape very similar to *M. Dictynna*, which it resembles also in the upper surface of its wings; beneath, the primary pair are more fulvous than in that species; secondary pair, straw-coloured with black veins, but near the base they have three large square yellowish spots surrounded with black; a band in the middle, composed of many yellowish spots of a form inclining to square, and surrounded with black; a streak of black crescents; a marginal band of yellowish spots also encircled with black, each yellow spot having a black crescent; lastly they are fringed with black and white.

*Caterpillar.* Black, with a pale grey lateral stripe; spines black.

*Chrysalis.*

MELITÆA DICTYNNA, PEARL-BORDERED  
LIKENESS.

*Lewin, pl. 14, f. 5, 6.*

*Butterfly.* Wings brownish black, spotted with tawny orange; underneath tawny inscribed and spotted with

black. Primary wings, underneath, spotted at the tips with yellowish. Secondary, underneath, near the base with five angular yellowish spots, the three inner ones in a triangle, each with a black margin; then a band of yellowish contiguous spots edged with black; at the posterior margin, another band with several connected spots, each edged with black, and terminated by a pair of black parallel waving transverse lines, which are common to both wings; fringe black and white.

*Caterpillar.* Reddish violet dotted with bright blue, with three black stripes.

*Chrysalis.*

#### MELITÆA EOS, DARK UNDER-WINGED FRITILLARY.

*Butterfly.* Primary wings tawny, with black blotches, underneath with a black band and tawny veins. Secondary black with a tawny streak, underneath with a white band spotted and veined with black.

*Caterpillar.*

*Chrysalis.*

*Observation.* This beautiful Fritillary being taken near London, very early in the morning, June 1803, by Mr. Howard, of Kingsland, was therefore named *Eos*; it has a considerable resemblance to the foregoing (*Dictyna*), but is nevertheless abundantly distinct from that species.

#### MELITÆA CINXIA, GLANVILLE FRITILLARY.

*Lewin, pl. 14, f. 3, 4. Donovan, v. 7, p. 242. Duncan, pl. 14, fig. 2.*

*Butterfly.* Wings above orange-tawny, chequered with black; primary underneath inscribed towards the base with

black, with a bent band of black spots in the middle, at the tip yellowish with a double transverse series of black dots. Secondary on both sides towards the posterior margin with a band of ocellated spots, of which the pupil is black and the iris yellowish; underneath with three yellowish angular bands and two orange-tawny ones, all edged and spotted with black.

*Caterpillar.* Greenish, streaked with white, with a dull brown head.

*Chrysalis.*

*Observation.* This is one of the most rare of the Fritillaries; and took its name from Lady Glanville, whose memory had nearly suffered for her curiosity, from relations that were disappointed by her will, who attempted to set it aside by acts of lunacy; for they suggested that none but those deprived of their senses, would go in search of Butterflies. Her legatees cited Sir Hans Sloane and Mr. Ray in support of her character, and her will was established.\*

MELITÆA ARTEMIS, GREASY FRITILLARY.

*Lewin, pl. 15, f. 3, 4. Duncan, pl. 13, fig. 2.*

*Butterfly.* Wings above tawny-orange, waved with black, with yellowish spots. Secondary wings on both sides before the posterior margin, with an orange coloured band containing seven small black dots, which underneath nearly become eyelets, with a yellowish iris. Primary wings underneath paler, and with very little blackness. Secondary, underneath, with three yellowish bands, the first towards the base interrupted, the second in the centre arched, the marginal one consisting of seven yellow crescents.

\* *Vide Preface to "Brown's Book of Butterflies," p. 15.*

*Caterpillar.* With a black head, body black above, underneath yellowish, with a lateral white stripe; legs reddish.

*Chrysalis.* Greenish-white dotted with black, and posteriorly furnished with many whitish-yellow tubercles.

*Observation.* All the wings of this species have a sort of greasy appearance upon their disk, whence its name.

#### MELITÆA LUCINA, DUKE OF BURGUNDY FRITILLARY.

*Lewin* pl. 15, f. 5, 6. *Donovan* v. 7, p. 242. *Duncan*, pl. 12, fig. 1.

*Butterfly.* Like the preceding, but almost thrice as small. All the wings above, chequered with black and tawny, blackening at the base. Primary wings, underneath, tawny, marked with black and pale. Secondary wings, underneath, of a deep tawny, with two bands of whitish spots, and a marginal series of black dots; fringe brown and white.

*Caterpillar.* Pale olive brown, with a black dot on each segment; head and legs rusty red.

*Chrysalis.*

#### Genus ARGYNnis, pl. II, fig. 7.

*Antennæ* like those of *Melitæa*.

*Palpi* not much longer than the head, robust, acute.

*Forelegs* like those of *Melitæa*.

*Wings* scalloped; *primary* often subfalcate; *secondary* like those of *Melitæa*.

*Egg* conical, subumbilicate, many ridged, vertex rounded.

*Caterpillar* spinose.

*Chrysalis* subangular, suspended, head-case notched.

*Sepp.* II, i, pl. 1.

ARGYNNIS PAPIIA, SILVER-WASHED  
FRITILLARY.

*Lewin*, pl. 9. *Donovan*, v. 7, p. 246. *Duncan*, pl. 14, fig. 1.

*Butterfly*. All the wings above, of a fine rich tawny orange, marked with numerous longitudinal and transverse black lines and bars, and a triple series of marginal black spots. Primary wings, underneath, paler and less spotted, particularly at the tips. Secondary, greenish underneath, with four narrow silvery waved bands, of which the first and second are interiorly abbreviated, the third below the middle, the fourth marginal; a series of obscure eyelets between the centre band, and the margin with a pale pupil and green iris, also of green crescents at the margin. Female differs a little, above the colours are more obscure and without the black lines, underneath paler, and more green.

*Caterpillar*. Solitary, of a yellowish brown, with a yellow dorsal line.

*Chrysalis*. Greyish, toothed, six points, four anterior ones gold.

## ARGYNNIS AGLAIA, DARK-GREEN FRITILLARY.

*Lewin*, pl. 11. *Donovan*, v. 9, p. 302. *Duncan*, pl. 15, fig. 1.

*Butterfly*. Very like the preceding, on the upper side of the wings, but without the black streaks. Primary wings, underneath, with six posterior obsolete silver spots. Near the anterior margin marked on both sides with five black bars or streaks, the fourth resembling a *B*. Secondary wings, underneath, greenish, with an obscure posterior tawny band,

spotted with twenty-one silver spots. Female, particularly above, rather darker, otherwise like the male insect.

*Caterpillar.* Blackish, with a yellow dorsal stripe, and tile-coloured lateral spots. Spines are black.

*Chrysalis.* Of a dark reddish brown.

#### ARGYNNIS CAROLETTA, QUEEN OF ENGLAND FRITILLARY.

*Butterfly.* Very like *A. Aglaia*, but more beautiful, and it differs in the primary wings, having on both sides four black costal bars instead of five. And in the secondary, having beneath, nineteen silver spots instead of twenty-one, of which the three anterior ones are three times larger than in that species. *Rare.*

*Caterpillar.*

*Chrysalis.*

#### ARGYNNIS ADIPPE, HIGH-BROWN FRITILLARY.

*Lewin, pl. 10.* *Donovan, v. 13, p. 448.* *Duncan, pl. 16, fig. 1.*

*Butterfly.* Similar to *A. Aglaia*, especially in the upper side of the wings. Primary wings, underneath, with six or seven different shaped silver scattered spots near the base, then as it were a band of seven square silver spots, the fourth like a dot, then a streak as it were of six or seven ferruginous red round spots, of which the third, fourth, and fifth for a pupil have a silver dot, lastly a marginal band of seven silver spots, anteriorly edged with ferruginous. Female above, deeper coloured.

*Caterpillar.* Brownish, with ferruginous hairs, with a whitish interrupted dorsal stripe, and black oblique streaks.

*Chrysalis.* Brownish, spotted with white.

*Observation.* Mr. Duncan observes that many varieties of this insect have been described, some having the upper wings almost black.

ARGYNNIS LATHONIA, QUEEN OF SPAIN  
FRITILLARY.

*Lewin, pl. 12. Donovan, v. 3, p. 73. Duncan, pl. 16, fig. 2.*

*Butterfly.* All the wings, above, tawny-orange, spotted with numerous distinct black dots. Primary wings, underneath, paler, with numerous black spots, with from five to seven different shaped silver ones at the tips. Secondary, underneath, with twenty-eight silver spots, of which eighteen are larger and ten smaller, besides fourteen of such spots scattered between the base and centre, then an arched streak consisting of seven small subocellated spots. pupil silver, iris dark ferruginous, lastly a marginal band consisting of seven large silver spots.

*Caterpillar.* Brownish grey, with a whitish dorsal stripe, two brownish yellow lateral longitudinal lines; the spines and feet are pale yellow.

*Chrysalis.* Dull brown, with a yellow dorsal stripe, sprinkled posteriorly with gold and silver dots; there is a white streak at the end of the wing-cases.

Genus CINTHIA.

*Antennæ* long, with a short abrupt compressed knob, terminating in a point; joints nearly forty.

*Palpi* very long, porrected, curving downwards at the tip.

*Forelegs* spurious.

*Claws* long, double ; *foot cushions* short.

*Wings* scalloped ; *primary* triangular, subfalcate ; *secondary* between wedge-shaped and ovate, forming together a groove to receive the abdomen.

*Egg*, *Caterpillar*, and *Chrysalis*, like those of *Vanessa*.

### CINTHIA CARDUI, PAINTED LADY.

*Lewin*, pl. 6. *Donovan*, v. 9, p. 292. *Duncan*, pl. 19, fig. 2.

*Butterfly*. Primary wings above, tawny-brown at the base, in the middle tawny, often with a tint of carmine and orange, with three irregular black spots in a transverse band, at the tip black, with several square white contiguous spots, the three intermediate ones distinct, and two much smaller than the others, all forming a chaplet open to the anterior margin, between which and the posterior margin is a row of white crescents ; underneath nearly the same, but the carmine tint, in recently disclosed specimens, is more prevalent and vivid ; the costal areolet is transversely streaked with black, three white bars at the anterior margin ; the tip is light brown with two eyelets, with a white pupil and a round white spot. Secondary wings above, tawny brown, at the base with a paler spot and hairy ; tawny orange at the posterior margin, with a triple marginal series of black spots, underneath clouded and marbled with pale olive brown, pale yellow, and white, intersected with white veins, with five eyelets near the posterior margin, the external one spurious and oblong, the second and fifth the largest, with a yellow iris edged with black, and purple pupil and the two middle ones smaller with a blue pupil ; there is a row of olive and white crescents between the eyelets and the posterior margin.

*Caterpillar.* Solitary, dull brown, with yellow lateral longitudinal stripes.

*Chrysalis.* Dull brown, with whitish brown longitudinal streaks, and dotted with gold.

*Observation.* This is rather a scarce species, but sometimes appears in great numbers.

*Genus VANESSA, pl. II, fig. 8.*

*Antennæ* rather long, with a rather abrupt oblong subcylindrical knob, terminating in a lateral point; joints about thirty.

*Palpi* more than twice the length of the head, very hairy.

*Forelegs* spurious.

*Claws* long, double, internal one slender; foot cushions nearly obsolete.

*Primary wings* triangular subfalcate, angular; *secondary* subtriangular scalloped, often furnished with a short tail, and forming together a groove to receive the abdomen.

*N. B.*—In *V. Atalanta* the secondary wings have no rudiment of a tail; and in *V. C. Album* the primary are narrow and sinuated, and the tail of the secondary is rather long.

*Egg* oval, many ridged, and umbilicated.

*Caterpillar* spinose.

*Chrysalis* subangular, suspended \*; head-case cared.

*Sepp.* I. i. pl. i. ii. vi.

**VANESSA ATALANTA, RED ADMIRAL.**

*Lewin*, pl. 1. *Donovan*. v. 3, p. 89. *Duncan*, pl. 20, fig. 1.

*Butterfly.* Wings indented subangulate, black edged with white crescents. Primary with a central orange-red band,

\* By this term it is meant that the Chrysalis is suspended by its tail.

between which and the tip, is a chaplet open to the anterior margin formed of white spots and dots. Underneath, between the band and chaplet are some blue streaks, only two white spots and a dot, and two imperfect eyelets with a white pupil and black and grey iris. The band is divided in two, the lower part sending out a branch towards the base, and another red streak and a blue one between this branch and the base. Costal areolet underneath black, marbled with blue. Female differs from the male in having a white spot on the band. Secondary, orange-red at the posterior margin, with a transverse series of distinct black triangular dots; underneath, marbled with black, brown, and pale tawny, with a pale triangular spot in the middle at the anterior margin, a band of obsolete obscure eyelets near the posterior margin.

*Caterpillar.* Solitary, green with yellow dorsal lines.

*Chrysalis.* Black, underneath cinereous with gold dots.

*Observation.* This rich and magnificent insect appears but in autumn, when it is generally to be seen in gardens flitting alternately with vigour and delight from fruit to flower, as if vying with the mellow tints and down of the peach, or the more brilliant and varied hues of the dahlia. It is very short-lived.

#### VANESSA, IO, PEACOCK.

*Lewin, pl. 4. Donovan, v. 6, p. 206. Duncan, pl. 18, fig. 1.*

*Butterfly.* Primary wings, above, purplish or brownish red. Costal areolet black with transverse streaks of pale yellow. Anterior margin with black and yellow spots; near the tip a large eye-like spot, which, for the pupil has a large reddish brown spot darker anteriorly, the iris is anteriorly

yellow, posteriorly blue, streaked with three blueish white dots; there are also two of these dots without the eye, the first has a faint blue iris. Margin of the wings brownish black. Secondary wings, above, towards the margin have a large eye-like spot, with a large black pupil spotted with blue, and a black iris with a whitish margin, which interiorly terminates in a black crescent. The wings underneath are brown, marbled, banded, and spotted with black, the primary have posteriorly five obsolete white dots, and the secondary one.

*Caterpillar.* Black, spotted with white.

*Chrysalis.* Green, dotted with gold.

*Observation.* This species frequently hibernates in the imago or perfect state, and occasionally survives the winter, or according to Brahm, in the three states of egg, pupæ, and imago.

#### VANESSA ANTIOPA, WHITE BORDERED.

*Lewin, pl. 1.* *Donovan, v. 3, p. 89.* *Duncan, pl. 18, fig. 2.*

*Butterfly.* Wings with a white or pale posterior margin powdered more or less with black, a series of blue spots behind it. Primary wings with costal areolet marbled with white, with two white spots at the anterior margin near the tip. Wings underneath marbled, otherwise as above, but without the blue spots. Secondary with a central white dot in each.

*Caterpillar.* Black, with four square dorsal ferruginous spots; legs red.

*Chrysalis.* Black, dotted with tawny.

*Observation.* There is something very extraordinary in the periodical but irregular appearance of this species, C.

*Edusa* and *C. Cardui*. They are plentiful all over the kingdom in some years; after which *V. Antiopa* in particular, will not be seen by any one for eight or ten or more years, and then appear again as plentifully as before. To suppose they come from the continent, is an idle conjecture, as it must have been long known to the lepidopterist as a native of Britain; besides which, the English specimens are easily distinguished from all others by the superior whiteness of their borders. From its scarcity it received at first from Harris the name of the "Grand Surprise," and afterwards in his "Aurelian," that of the "Camberwell Beauty." Perhaps their eggs, in this climate, like the seeds of some vegetables, may occasionally lie dormant for several seasons and not hatch, until some extraordinary but undiscovered coincidence awake them into active life.

#### VANESSA POLYCHLOROS, LARGE TORTOISESHELL.

*Lewin* pl. 2. *Donovan* v. 8, p. 278. *Duncan*, pl. 17, fig. 2.

*Butterfly.* Wings of a dark orange. Primary with eight black spots, two large and angular of the anterior margin, two nearer the base nearly coalescing into one, two in the centre smaller than the rest, and two near the interior margin. Posterior margin black, with a series of pale crescents. Base of the wing with tawny hairs and scales. Underneath the wing is black at the base and posterior margin with a paler broad posterior band, marbled with brown, three pale equidistant spots at the anterior margin. Secondary wings black at the base anteriorly, interiorly covered with long tawny hairs and scales, a black band at the posterior margin, with blue and pale crescents; black underneath with a paler broad posterior marbled band,

margin black, marbled, with a series of more black angular spots, a white discoidal dot.

*Caterpillar.* Blackish, with yellow lateral stripes.

*Chrysalis.* Flesh-coloured.

*Observation.* The larvae of this species, while young, live together under a silken web, which they spin for their protection; but they disperse after moulting their first skin. The Butterfly, although abundant on the continent, is scarce in many districts of England.

#### VANESSA URTICÆ, SMALL TORTOISESHELL.

*Lewin, pl. 3. Donovan, v. 2, p. 55. Duncan, pl. 19, fig. 2.*

*Butterfly.* The wings of a pale orange, with a black posterior marginal band with a series of blue crescents in it. The posterior margin itself is brown, with two parallel pale lines, the base of the wing black, powdered with tawny. The primary wings above, with the costal areolet mottled with black and tawny, six black, three yellow, and one white spot variegate the wing; two of the black spots are marginal, two are placed towards the base, and two in the disk, those of the margin being the largest, and those of the disk the smallest. Underneath they are pale variegated with black, with a black angular posterior band. Secondary above, black at the base, and covered with long tawny hairs. Underneath black, with a white discoidal spot and a pale band marbled with brown, between which and the posterior margin is a black angular posterior band.

*Caterpillar.* Variegated with dusky brown and green, head black.

*Chrysalis.* Brownish, spotted on the neck with gold, sometimes entirely of a golden hue.

*Observation.* The eggs of this species, (which has several broods in the year), when laid in summer are hatched in a few days; but if not laid till the close of the autumn, they remain dormant through the winter, and are hatched at the return of spring. The larvae arrive at their full size about June, when they throw out from their tails a web, by which they suspend themselves under the leaves, or on the stalks of nettles, and are transformed into chrysalids; in this condition they continue about twenty days, when they assume the perfect state. This species hibernates in the perfect state, and sometimes survives the winter.

#### VANESSA C. ALBUM, COMMA.

*Lewin, pl. 5. Donovan, v. 6, p. 199. Duncan, pl. 17, fig. 1.*

*Butterfly.* Wings above, dark orange, spotted with black and brown, with a brown posterior margin. Primary angular sinuated. Secondary dentate tailed. Primary underneath, brown clouded with grey, with a broad irregular marbled pale band near the posterior margin. Secondary underneath, at the base brown clouded with grey, paler at the tip, with the letter C reversed, and snowy white. A series of spurious eyelets with a greenish iris, and black pupil near the posterior margin of both wings underneath.

*Caterpillar.* Of a pale tawny orange, dorsally anteriorly yellow, posteriorly white.

*Chrysalis.* Fleshly, contracted in the middle, reddish dotted with gold.

*Observation.* This is not a common insect, and is rather local; those hatched in the autumn are generally paler than the first brood.

*Genus APATURA, pl. II, fig. 9.*

*Antennæ* rather long; knob oblong, rather tapering, terminating in a lateral point; joints about forty.

*Palpi* longer than the head, curving downwards at the tip.

*Forelegs* spurious.

*Claws* simple; foot cushions short.

*Wings* scalloped; *primary* subtriangular, subfalcate; *secondary* between round and triangular; grooved for the abdomen.

*Egg* unknown.

*Caterpillar* fusiform, spinose, horned at the head.

*Chrysalis* subangular, hunched, suspended, head-case beaked.\*

*Hübner Schmet.* pl. xxv. E. C.

## APATURA IRIS, PURPLE EMPEROR.

*Lewin*, pl. 16. *Donovan*, v. 2, p. 37. *Duncan*, pl. 21.

*Butterfly.* Wings above black, tinted as the light shifts with a most beautiful mazarine blue. The primary with several white spots dispersed in a triple series, 1, 5, 2; the secondary with a white angular band, and an eyelet at the anal angle with a narrow tawny iris, and black pupil. Underneath the primary are variegated with brown, tawny, black, and white, and the posterior margin is cinereous. An eyelet with a black iris, and blueish pupil is placed between the disk and the posterior margin. The secondary wings have a pyramidal angular white band, they are reddish brown and cinereous at the posterior margin, with a small eyelet, coloured as in the primary, at the anal angle. The wings of the female are not tinted with blue.

\* N. Dict. D'Hist. Nat. xxiii. 119.

*Caterpillar.* Of a beautiful green, with reddish bristles at the tail, horns greenish yellow.

*Chrysalis.* Pale green.

*Observation.* "This Purple Emperor of the British oaks," observes Haworth,\* "is not undeservedly the greatest favourite of our English Aurelians. In his manners, likewise, as well as in the varying lustres of his purple plumes, he possesses the strongest claims to their particular attention. In the month of July he makes his appearance in the winged state, and invariably fixes his throne upon the summit of a lofty oak, from the utmost sprigs of which, on sunny days, he performs his aerial excursions; when the sun is at the meridian, his loftiest flights take place, and about four in the afternoon, he resumes his station of repose. He ascends to a much greater elevation than any other insect; sometimes mounting higher than the eye can follow, especially if he happens to quarrel with another Emperor, the monarch of some neighbouring oak; they never meet without a battle, flying upwards all the while, and combatting with each other as much as possible; after which they will frequently return again to the identical sprigs from whence they ascended. The wings of this fine species are of a stronger texture than those of any other in Britain, and more calculated for that gay and powerful flight, which is so much admired by Entomologists. The females, like those of many other species, are very rarely seen on the wing; the reason of which is both interesting and but little known. It is their being destitute of a certain *spiral socket*, which the males possess near the basis of the main tendon of the upper wings; which *socket* receives and works a strong elastic *spring*, arising from the base of the under wings; thereby

\* *Lepidoptera Britannica*, p. 19.

enabling them to perform a stronger, longer, and more easy flight than it is possible for the females to do. Moses Harris was the first who published figures of this *socket* and *spring*, in an ingenious but little known work, called "An Essay preceding a Supplement to the Aurelian, wherein are considered the Tendons and Membranes of the Wings of Butterflies." Where in proof of this he states that Mr. Whitworth caught thirteen of *A. Iris* in one day, and but one *female* amongst them. I can credit this, continues Haworth, for in three days I captured myself twenty-three, (nine of them in one day), but never took a female at all. The males fly very high, and are only to be taken by a bag-net, fixed to the end of a rod twenty or thirty feet long. There have been instances, though very rare, of their settling on the ground near puddles of water, and being taken there. When the Purple Emperor is within reach, no fly is more easily taken than him ; for he is so very bold and fearless, that he will not move from his settling-place until you quite push him off; you may even tip the ends of his wings, and be suffered to strike him again. This species sips the juices which flow from the bodies of oak trees, and in all probability feeds upon the honey-dew.

*Genus LIMENITIS, pl. III. fig. 10.*

*Antennæ* long ; knob tapering long and slender, with a tip ending in a lateral point.

*Palpi* longer than the head, scaly, and not very hairy.

*Forelegs* much slenderer than the others.

*Claws* simple ; with a short foot cushion.

*Eyes* hairy.

*Wings* a little scalloped ; *primary* triangular ; *secondary* between round and triangular, with a shallow groove for the abdomen.

*Egg* unknown.

*Caterpillar* long, setose or spinose, tuberculated.

*Chrysalis* subangular hunched, suspended, head-case beaked.\*  
*Hübner Schmet.* pl. xxii. D. b.

### LIMENITIS CAMILLA, WHITE ADMIRAL.

*Duncan, pl. 20, fig. 2.*

*Butterfly.* Wings above brownish black, obscurely spotted with black with a white macular central band, intersected with black veins, common to both wings, interrupted in the primary, and terminating at the anal angle of the secondary in a sharp point. Fringe short, snowy white, barred with brown. Primary with a cinereous discoidal crescent between the band and the base, and four white dots: viz.—one where the band is interrupted, two at the anterior margin near the tip, and one near the middle at the posterior margin, a double series of obscure black marginal spots. Underneath brown, clouded with orange-tawny, central arcolet inscribed with black signatures; band and white spots nearly as in upper sides. Secondary above, with a triple series of obscure black spots at the posterior margin; underneath at the base and internally grey or hoary, then tawny-orange with black signatures, at the posterior margin brownish orange, with a double series of black spots, between which and the margin in the middle are some white blots.

*Caterpillar.* Green, with a red head.

*Chrysalis.* Green, spotted with gold, forked in front.

*Observation.* The graceful elegance displayed by this charming species when sailing on the wing, is greater perhaps

\* *N. Dict. D'Hist. Nat.* xxiii. 116.

than can be found in any other we have in Britain. "In its beautiful flight," observes the late Rev. Revett Sheppard, a most intelligent and scientific naturalist, "when it skims aloft it rivals the Purple Emperor, which it strongly resembles in appearance. It seems, however, (unlike the latter), to avoid the sun-beams, for it frequents the glades of woods, where it rapidly insinuates itself by the most beautiful evolutions and placid flight, through the tall underwood on each side the glades, appearing and disappearing like so many little fairies." It sometimes alights to suck the blossoms of the bramble. "There was," says Haworth, "an old Aurelian in London, so highly delighted at the imitable flight of Camilla, that long after he was unable to pursue her, he used to go to the woods, and sit down on a stile, for the sole purpose of feasting his eyes with her fascinating evolutions."

*Genus HIPPARCHIA, pl. II, fig. 11.*

*Antennæ* rather long; knob tapering at both ends, slender, curving; joints about forty.

*Palpi* scarcely longer than the head, hairy, curving downwards.

*Forelegs* spurious.

*Claws* short, bifid; foot cushions short.

*Primary wings* triangular; *secondary* between round and ovate, scalloped; forming a shallow groove for the abdomen.

*Eggs* various.\*

\* In this genus sometimes (*H. Pilosella*, Sepp. I. i. pl. iii. fig. 2.) the egg is subconical, many-ridged, with the vertex truncated; at others (*H. Hyperanthus*, Sepp. I. i. pl. iv. fig. 2.) it is subglobose, without ridges, and covered with little punctures. In some (*H. Jurtina*, Sepp. I. i. pl. v. fig. 2.) it is of the same shape as the last named, but it is many-ridged, and scaly at the vertex; and lastly in others (*H. Egeria*, Sepp. I. i. pl. vi. fig. 2.) the form remains the same, but the surface resembles net work.

*Caterpillar* subfusciform, tuberculated; tail bifid.

*Chrysalis* angular, suspended; head-case eared.

*Sepp.* I, i. pl. iii..—vi.

N. B.—*H. Semele* in its antennæ varies from the other *Hipparchia*, the knob being abrupt, wide and short.

### HIPPARCHIA HYPERANTHUS, RINGLET.

*Lewin*, pl. 20. *Donovan*, v. 8, p. 281. *Duncan*, pl. 24, fig. 4.

*Butterfly*. The primary wings above, brown, often with one or two black spots faintly ocellated; underneath, with three posterior eyelets, the innermost being very minute. The secondary wings above, with two eyelets, underneath with two contiguous eyelets near the anterior margin, and with three posterior ones distinct, the third towards the anal angle twice as small as the others. All the wings paler, and edged with a whitish fringe.

N. B.—In the male? The wings are darker in the upper side, with only one spurious eyelet in the primary, and underneath the minute eyelet is wanting, but the others are more distinct.

*Caterpillar*. Whitish grey, with a narrow brownish stripe. Sometimes black.

*Chrysalis*. Bright brown, with obscure streaks and shadows.

*Observation*. This Butterfly, which presents great variation in the size and number of the ocelli, deposits her eggs at random, on different plants. The Caterpillar is polyphagous. It has been noticed, that all larvæ which live in solitude, proceed from eggs laid singly.

## HIPPARCHIA DAVUS, SMALL RINGLET.

*Lewin, pl. 23, f. 5, 6. Duncan, pl. 26, fig. 1.*

*Butterfly.* The primary wings above, brownish tawny, with two blind eyelets posteriorly. Underneath of the same colour, with a posterior whitish band, which does not reach the margins. Between the band and the posterior margin are two eyelets with a black iris and white pupil, with an imperfect or blind smaller eyelet between them. The secondary wings have about three blind eyelets, the central the largest, with a tawny iris; underneath they are brown at the base, with a middle whitish angular band, between which and the posterior margin are six eyelets, consisting of a whitish iris, a black pupil, with a central silver dot.

N. B.—In the specimen described, on the under side of the primary wings the eyelet nearest the exterior margin is sesquialterous, or has a minute one appended to it.

*Caterpillar.*

*Chrysalis.*

*Observation.* This scarce insect frequents marshes and moist heaths.

## HIPPARCHIA POLYDAMA, MARSH RINGLET.

*Duncan, pl. 26, fig. 2.*

*Butterfly.* Primary wings tawny, with two posterior blind eyelets. Secondary wings brown, but internally whitish, with a minute blind eyelet near the anal angle. Below the primary are darker at the base, inclined to ash colour at the tips, with a posterior abbreviated whitish band; between

which and the posterior margin are two remote eyelets with a white obsolete pupil and black iris. The posterior below blackish at the base, with a white little band, behind which they are ash-coloured ; there are also six eyelets, three of which are imperfect, all surrounded by a white iris.

*Caterpillar.* Green, with a dark line along the back.

*Chrysalis.* Dark green ?

*Observation.* This is probably only a variety of the preceding.

#### HIPPARCHIA TYPHON, SCARCE HEATH.

*Butterfly.* The wings of the male above, are between tawny and ferruginous ; the primary above, are distinguished posteriorly by a small brown spot surrounded by a tawny iris ; below they are ferruginous, with an abbreviated whitish band behind the middle, between which and the margin is an eyelet, with a white pupil and a black iris with a white margin, the tip of the wing is also whitish. The secondary wings beneath from the base to the middle are very hairy and brownish, or in a certain light greenish ; next follows a whitish abbreviated streak or band, then a paler space beyond the middle, with two obsolete eyelets, and last is a marginal whitish band. The female differs from the male in having rather paler wings, the primary having no small spot, but as well as the secondary wings having a large one rather pale ; beneath they have only a sesquialterous eyelet. The secondary below, have two eyelets, and three ocellated dots without a white pupil. The margin of the wings is whiter.

*Caterpillar.*

*Chrysalis.*

## HIPPARCHIA PAMPHILUS, SMALL HEATH.

*Lewin*, pl. 23, f. 3, 4. *Duncan*, pl. 26, fig. 3.

*Butterfly.* Wings all tawny with darker margins. The primary have a posterior blind eyelet, these underneath are cinereous at the base and tip, have a largish posterior eyelet with a white pupil and black iris, with a whitish margin. The secondary wings underneath, are brown at the base, cinereous at the tip, with an abbreviated whitish slender band in the middle, and with four minute obliterated eyelets.

*Caterpillar.* Green, with white dorsal lines.

*Chrysalis.* Green.

## HIPPARCHIA SEMELE, GREYLING.

*Lewin*, pl. 17. *Donovan*, v. 8, p. 259. *Duncan*, pl. 22, fig. 1.

*Butterfly.* The primary wings dull brown, with a lower pale interrupted irregular transverse band abbreviated at each end, in which are two eyelets on both sides, the pupil white very minute, with a black broad iris, in the male often without the pupil. Underneath at the base, brown with a tawny disk, then a pale broad band; the posterior margin is clouded with brown and white. The secondary wings dull brown above, with a broad posterior transverse pale band, clouded with brown, in which in the female there is a small eyelet, iris tawny with a black pupil. Posterior margin black, brown fringed with white. Underneath clouded with white, brown, and black, the base darker than the posterior half of the wing, the darker part terminating in an irregular sinuated line. The female much paler than the male, and with larger eye-like spots.

*Caterpillar.* Light green, with brown legs.

*Chrysalis.* Greenish.

### HIPPARCHIA GALATEA, MARBLED WHITE.

*Lewin*, pl. 28. *Donovan*, v. 8, p. 258. *Duncan*, pl. 23, fig. 1.

*Butterfly.* Wings pale buff-coloured, spotted with black. Primary above, with a double series of buff-coloured dots at the posterior margin; underneath of the same colour but paler, with an eyelet near the tip and anterior margin. Secondary with five lower spots, two near the anterior margin, and three towards the interior margin, of which the one nearest the anal angle is double, behind they form an indented black band.

*Caterpillar.* Vivid green, with the dorsal and lateral lines obscure. Head brownish.

*Chrysalis.* Smooth, egg-shaped, of a yellowish colour, with long wing-cases, and two black eye-like spots on each side of the head.

### HIPPARCHIA MEGÆRA, WALL.

*Lewin*, pl. 21. *Donovan*, v. 8, p. 279. *Duncan*, pl. 22, fig. 3.

*Butterfly.* The primary wings above, orange-tawny, with the posterior margin and three transverse brown bands, (one in the male oblique and larger than the others dividing the wing), with an eyelet on both sides near the tip, and often with a minute one appended to it, the pupil white, iris black; underneath in both sexes, a little paler, with alternate black transverse bands, the intermediate ones being abbreviated. The secondary wings at the base, dull brown,

posteriorly orange-tawny, with a brown band and margin; between the band and posterior margin are four eyelets, the lateral ones often blind, pupil white and iris black; underneath, a clouded greyish brown, with slender angular bands and six posterior eyelets, (the sixth being double), the pupil black with a white central dot in a grey iris. There is a scalloped pale band between the eyelets and the posterior margin.

*Caterpillar.* Slender, sea-green, with dark dorsal and sides striped.

*Chrysalis.* Blackish.

#### HIPPARCHIA ÆGERIA, SPECKLED WOOD.

*Lewin* pl. 19. *Donovan* v. 14, p. 498. *Duncan*, pl. 23, fig. 4.

*Butterfly.* The primary wings on both sides brown, with about ten yellowish spots, and with one eyelet towards the tip. The secondary ones brown, with one or more yellowish spots, and with four posterior eyelets, of which the first is often blind; underneath clouded with brown and with angular brown bands, and in lieu of the eyelets, white dots in the mottled marginal band.

*Caterpillar.* Green, with white longitudinal lines.

*Chrysalis.* Green, short and unusually distended.

#### HIPPARCHIA HAMPSTEDIENSIS, ALBIN'S HAMPSTEAD EYE.

*Butterfly.* Size and form of *H. Ægeria*. Primary wings above, dark brown, with five spots and marginal streak yellow; two large posterior eyelets on both sides, pupils white with broad black irides. The secondary brown, with

a marginal yellow streak; two posterior eyelets, with white pupils and black irides. The primary underneath, yellowish, clouded with dark brown, having an obsolete streak composed of dark brown crescents. The secondary yellowish, a little clouded towards the base with dark brown; with a small and nearly obliterated eye, with a black iris, four dark brown spots, between which and the posterior margin is a streak composed of dark brown crescents.

*Caterpillar.*

*Chrysalis.*

*Observation.* This insect has not been taken since the time of Petiver.

#### HIPPARCHIA JANIRA, MEADOW BROWN.

*Lewin*, pl. 18. *Donovan*, v. 9, p. 320. *Duncan*, pl. 24, fig. 1, 2.

*Butterfly.* Wings of the female above brown, sometimes nearly black. The primary above, with a tawny-orange irregular band or blot abbreviated at both ends, and containing an eyelet with a black iris and white pupil, between the band and the base is an obscure tawny longitudinal blot; in some specimens the eyelet is merely cinctured with tawny orange, with a very obscure tawny blot behind it; underneath tawny-orange, with a paler band towards the posterior margin, eyelet as above, but with a double pupil, margin embrowned; in some specimens, the eyelet has only one pupil, and the margins of the wings are brown. The secondary wings scalloped brown, with an indistinct paler band towards the posterior margin, underneath with more than the anterior half tawny-brown, terminating posteriorly in an angular line, the posterior half is paler with the margin embrowned, the whole underside appears dusted

with black; sometimes there are also two or three black eye-like spots. The male has no orange band, and the underside of the secondary wings is not so distinctly marked, the line being fainter and less angular than separates the darker from the paler portions, and the black dots smaller.

*Caterpillar.* Green, with a white lateral streak, thickly covered with soft flexible hairs.

*Chrysalis.* Yellowish-green, with blackish streaks on the head and wing-cases.

*Observation.* This is perhaps the most common as well as most hardy of British Butterflies; never being affected or deprived of its life and animation, either by excessive heat, or in the most rainy and cheerless summers.

#### HIPPARCHIA TITHONUS,\* LARGE HEATH.

*Lewin, pl. 14. 3, 4. Donovan, v. 7, p. 242. Duncan, pl. 23, fig. 2.*

*Butterfly.* The primary wings above, are tawny yellow, brown at the anterior and posterior margin, with an eye-like spot with two pupils, or two white points on a black spot, on both sides towards the tip. Underneath, tawny-orange, with a brownish margin. The secondary wings brown, with a tawny-orange disk, an obsolete cyclet towards the anal angle. Underneath, at the base, tawny-brown terminating in an angular line, posteriorly paler clouded with brown tawny, with from three to five minute white points or spurious cyclets.

*Caterpillar.* Greenish, streaked with white, with a dull brown head.

*Chrysalis.* Green.

\* This is *P. Pilosella* of Haworth and many authors.

## HIPPARCHIA HERO, SCARCE MEADOW BROWN.

*Butterfly.* Wings very intire, brown, primary underneath, with a single eyelet; secondary above, with four blind eyelets, underneath with six perfect ones.

*Caterpillar.*

*Chrysalis.*

## HIPPARCHIA LIGEA, ARRAN BROWN.

*Duncan, pl. 25, fig. 1.*

*Butterfly.* Wings scalloped, brown, with a reddish band, the primary ones having four eyelets on both sides; the secondary three, and spotted underneath with white. *Rare.*

*Caterpillar.* Green, with a black dorsal stripe, and several whitish longitudinal ones. The head is a reddish yellow.

*Chrysalis.*

## HIPPARCHIA MNEMON.

*Butterfly.\**

*Caterpillar.*

*Chrysalis.*

\* This appears to be *H. Cassiope* of Duncan.

## HIPPARCHIA ALCYONE.

*Butterfly.* Wings indented, brown, with a whitish band, the primary having two eyelets on both sides. The secondary underneath, marbled with brown and black, and having a white angular band and a single eyelet.

*Caterpillar.*

*Chrysalis.*

## HIPPARCHIA BLANDINA, SCOTCH RINGLET.

*Duncan, pl. 25, fig. 2.*

*Butterfly.* The wings indented, brown. The primary with a reddish ocellated band. The secondary underneath, brown, with an ash-coloured band.

*Caterpillar.* Light green, with brown and white longitudinal stripes.

*Chrysalis.*

*Genus THECLA, pl. III, fig. 12.*

*Antennæ* short, growing gradually thicker nearly from the base to the tip; joints more than forty.

*Palpi* longer than the head, scaly, with few hairs.

*Forelegs* spurious.

*Claws* very short, simple; with a large foot cushion.

*Primary wings* triangular intire; *secondary*, between triangular and ovate, often with short tails.

*Egg* unknown.

*Caterpillar* shaped like a wood-louse, short and rather flat.

*Chrysalis* girted, head-case rounded.

*Reaum, i. pl. xxviii. fig. 1-7.*

*Hübner Schmet. pl. lxxii. A. a.*

## THECLA BETULÆ, BROWN HAIR-STREAK.

*Lewin*, pl. 42. *Donovan*, v. 7, p. 250. *Duncan*, pl. 27, fig. 1, 2.

*Butterfly.* Wings dark brown, with a white fringe. The primary with a large kidney-shaped orange transverse spot nearer to the tip than the base; underneath, all the wings are orange tawny, with the posterior margin bright orange. The primary have in the middle a linear transverse spot edged with white, and a pyramide internally abbreviated, orange band darker at the tip, edged especially posteriorly with white. The secondary are tailed, with a rather pyramide indented, orange band, edged with white, and angle spotted with black. In the male, the discoidal spot of the primary wings is more obscure and smaller.

*Caterpillar.* Green, with yellow dorsal and lateral stripes, and with oblique yellowish streaks on the sides.

*Chrysalis.* Brown, with faint paler streaks.

## THECLA PRUNI, BLACK HAIR-STREAK.

*Lewin* pl. 44, f. 1, 2. *Donovan* v. 13, p. 437. *Duncan* pl. 28, fig. 1.

*Butterfly.* Wings dark brown, and without spots. Underneath, they are of a lighter brown or drab colour. Primary with a posterior white, rather undulated transverse streak. Secondary, tailed with a similar but zigzag streak, and a deep orange-coloured undulated marginal band, externally spotted and internally edged with black; the small tails of the wings are brown with black tips, antennæ annulated with black and white, orange at the tip.

*Caterpillar.* Plump, blackish green, with whitish lateral lines, dorsally toothed.

*Chrysalis.* Dusky brown, white head.

## THECLA QUERCUS, PURPLE HAIR-STREAK.

*Lewin*, pl. 43. *Donovan*, v. 13, p. 460. *Duncan*, pl. 27, fig. 3, 4.

*Butterfly*. Above brownish black, disk of the primary wings of a shining deep blue, formed of two great contiguous oblong spots drawn from the base towards the tip, the lowest being twice the size of the other. All the wings underneath are hairy, with a posterior white undulated streak common to them all; between which and the posterior margin the wing is paler. Secondary wings tailed, with one or two eyelets at the anal angle, with a fulvous iris and black pupil, which in the male are often whitish; a series of obsolete pale crescents near the margin. The female differs from the male in the primary wings being brownish purple, or often entirely purple, without any blue.

*Caterpillar*. Plump, above rose-coloured, with three rows of green dots.

*Chrysalis*. Naked, ferruginous, with three dorsal rows of brown dots.

## THECLA RUBI, GREEN HAIR-STREAK.

*Lewin*, pl. 44. *Donovan*, v. 13, p. 443. *Duncan*, pl. 28, fig. 3.

*Butterfly*. Less than *T. Quercus*. Above dusky brown, with sometimes (particularly in the female) a pale spot nearly obliterated in the disk of the primary wing near the costal margin. Underneath green. Secondary wings tailed, streaked below with a band of white dots, which (particularly in the male) is sometimes nearly obliterated, but there are always one or two dots.

*Caterpillar*. Green, variegated with yellow, head black.

*Chrysalis*. Brown.

*Genus LYCÆNA, pl. III. fig. 13.*

*Antennæ* with a longish tapering \* obtuse knob ; joints more than thirty.

*Palpi* longer than the head, above and whole of the last joint scaly, hairy underneath.

*Forelegs* perfect.

*Claws* very short, simple ; foot cushions large.

*Primary wings* triangular and nearly wedge-shaped, intire ; *secondary* between round and triangular, with a tooth or two near the anal angle.

*Egg* unknown.

*Caterpillar* shaped like a wood-louse, &c.

*Chrysalis* girted, head-case rounded.

*De Geer* i. pl. iv. fig. 9—15.

*Hübner Schmet.* pl. lxiv. A. a. a.

## LYCÆNA HIPPOTHOE,† LARGE COPPER.

*Duncan, pl. 29, fig. 1, 2.*

*Butterfly.* Male. Wings above of a shining and bright fiery copper-colour, with an articulate band of very faint round spots near the tip. Primary with a semi-lunar spot ; the costal and posterior margins black ; underneath paler orange with ten eyelets, with a large black pupil and white iris, the first three are placed longitudinally near the anterior margin, seven in a transverse subundulated band towards the posterior margin, besides which at that margin is a transverse series of black dots without the iris, the margin itself and fringe are whitish. Secondary wings with an oblong discoidal line, and the margins black, the black colour of the posterior margin is indented internally ; under-

\* The term "tapering," is perhaps used here and before, not with strict propriety, for tapering *downwards* ; but it appeared the most convenient term.

† This is *P. Dispar* of Haworth.

neath blueish, with numerous subocellated black spots, five towards the base scattered, then a waved band consisting of nine spots, between which and the others is an interrupted black discoidal line, all the spots have a white iris more or less distinct; the posterior margin deep orange-coloured, with an interior series of black spots, and an exterior one of black dots; fringe white, divided in two by a transverse black line. Female. Underneath similar to the male, but above it differs very much. The primary wings are not so fulgid and bright as those of the male, and are spotted with ten black spots, three near the costal margin placed longitudinally, and seven in an arched band near the tip; posterior margin not so black as in the male. Secondary wings dusky brown, with the veins, and a sixth-toothed posterior copper-coloured band.

*Caterpillar.* Somewhat hairy, with short inconspicuous hairs, vivid green and sprinkled with innumerable white dots.

*Chrysalis.* At first green, then pale ash-coloured with a dark dorsal line; a broad lateral stripe full ash-colour, besides the dorsal line there are two white abbreviated ones, one on each side of it.

*Observation.* This brilliant insect was first noticed by Hudson, who captured it in Wales; but it has been found very frequently since in Whittlesea-Mere, and Messrs. Standish met with it at the beginning of August flying among reeds in the Mere near Yaxley, Suffolk.

#### LYCÆNA VIRGAUREÆ, MIDDLE COPPER.

*Lewin*, pl. 41, f. 1, 2. *Donovan* v. 5, p. 173. *Duncan* pl. 29, fig. 3.

*Butterfly.* Male above, similar to the preceding, but nearly twice as small, and without the spots on the disk.

Primary wings underneath, pale tawny or yellowish, with eleven black spots scarcely ocellated, three placed longitudinally near the base, then seven or eight in an undulated band, less distinct towards the posterior margin. Secondary wings above, with six black spots resting upon the black posterior margin; underneath tawny, with fewer and larger black spots crowned with white; towards the posterior margin some orange spots at the anal angle, where the wings are somewhat emarginate, and there is a tendency to a tail. The female differs altogether from the male; the wings above are more obscure. Primary wings with numerous dots, and a nearly marginal band, consisting of confluent brown spots. Secondary wings are brown rather than tawny, with veins; a largish square spot with others smaller and more indistinct in the disk of a tawny colour; besides a knotty band consisting of six indentations at the posterior margin also tawny. All the wings underneath are the same as in the male.

*Caterpillar.* Dull green, hairy, with a yellow dorsal and yellowish green lateral stripes, black head and legs.

*Chrysalis.* Brownish yellow, with dark coloured wing-cases.

*Observation.* This is a very rare insect.

#### LYCÆNA CHRYSEIS, PURPLE-EDGED COPPER.

*Duncan, pl. 30, fig, 1.*

*Butterfly.* Wings subangulated: above bright copper-colour, with the dots of the disk and all the margins of a brownish purple. Primary underneath, with a yellowish disk, and a cinereous margin, with numerous ocellated dots, the pupil of which is black, and the iris white; three towards the base placed longitudinally, six behind the middle in an undulated band, and six at the posterior margin nearly

obliterated. Secondary wings underneath, inclining to cinereous, with numerous ocellated spots, ten scattered nearer the base, and nearly twenty-two in three posterior bands, besides one or two other fulvous spots towards the anal angle; fringe white above, brown underneath. Female above, more obscure and more spotted with black than that of the preceding species.

*Caterpillar.*

*Chrysalis.*

*Observation.* This, like the preceding, is a rare species.

#### LYCÆNA PHLÆAS, COMMON COPPER.

*Lewin*, pl. 41. *Donovan*, v. 13, p. 466. *Duncan*, pl. 30, fig. 3.

*Butterfly.* Primary wings above, of a bright copper-colour, with the posterior margin and ten discoidal spots black, two anterior ones arranged longitudinally, and the rest nearer the posterior margin placed in an irregular zigzag band, some distant, some confluent. Underneath, the wings are rather paler and more obscure with the same number of subocellated black spots, three arranged longitudinally and seven transversely; posterior margin drab-colour, with three black crescents near its inner part. Secondary wings above, brownish-black, with a five-toothed copper band at the posterior margin, sometimes with a discoidal black line and two black dots, and at others two white ones. Underneath drab-coloured with numerous nearly obliterated black dots, and an obsolete tawny band. Female altogether resembles the male.

*Caterpillar.* Clear green, with a yellow dorsal stripe.

*Chrysalis.*

*Genus POLYOMMATUS, pl. III, fig. 14.*

*Antennæ* rather short, with a rather abrupt largish compressed knob, terminating in a lateral point; joints more than thirty.

*Palpi* longer than the head, scaly above, hairy below, last joint without hairs.

*Forelegs* perfect.

*Claws* very short, simple; foot cushions very short or obsolete.

*Wings* intire; *primary* triangular and nearly wedge-shaped; *secondary* between ovate and triangular.

*Egg, Caterpillar, and Chrysalis*, as in *Lycæna*.

**POLYOMMATUS ARION, LARGE BLUE.**

*Lewin* pl. 37, f. 1, 2. *Donovan* v. 6, p. 184. *Duncan*, pl. 32, fig. 1.

*Butterfly.* Wings above, brown with a blue disk. Primary with five longitudinal black discoidal bars, with two or three black dots above them. Underneath brownish ash-coloured, with eight ocellated spots, two in the centre, and six or seven arranged in an undulated band between them and the posterior margin, all with a large black pupil, and white iris; at the posterior margin are two rows of black spots and crescents, with a very faint or obsolete iris. Secondary underneath, brownish ash coloured, blue-green at the base with eleven ocellated spots arranged in two bands, the first near the base consisting of three, the second in the middle angulated and interrupted, consisting of eight; between the bands is a transverse discoidal crescent, and at the margin two rows of subocellated black spots, as in the primary wings. Female differs from the male in having above larger, blacker, and more numerous spots, and the

margins of the wing are browner. Fringe in both sexes above white, and underneath white with brown bars.

*Caterpillar.*

*Chrysalis.*

*Observation.* Found generally in rocky situations covered with bushes and brambles, on the blossoms of which it feeds. Their flight is very slow and singular, flapping up their wings nearly together, but though slow, they are shy and difficult to catch, except with a bag-net fixed to a pole.

**POLYOMMATUS CORYDON, CHALK-HILL BLUE.**

*Lewin* p. 37. *f. 1, 2, 3.* *Donovan* v. 7, p. 237. *Duncan* p. 31, *fig. 3.*

*Butterfly.* Male. Wings of a pale silvery blue, or French grey, with the posterior margin black or brownish black; fringe white with brown bars. Secondary in both sexes with five ocellated spots in the posterior margin. Primary wings underneath, whitish, with ocellated spots nearly as in *P. Arion*. Secondary wings underneath, cinereous, greenish at the base, with about twelve ocellated spots arranged in two bands, the first near the base consisting of four, the second below the middle undulated consisting of eight, pupils in all black, with white iris; between the two bands is a white subtriangular discoidal spot, at the posterior margin is a series of ocellated spots, the intermediate ones crowned internally with an orange black and white angular spot; this series is connected with the central band by an oblong white blot. Female above, brown, each wing with a pale discoidal dot, which in the primary has a black pupil. Underneath, the same as in the male, but the secondary are deeper coloured, and the spot more strongly marked. The triangular discoidal spot has a black streak in it.

*Caterpillar.*

*Chrysalis.*

POLYOMMATUS ADONIS, CLIFDEN BLUE.

*Lewin*, pl. 38, f. 1, 2, 3. *Duncan*, pl. 33, fig. 1, 2.

*Butterfly.* Somewhat smaller than *P. Corydon*; wings of the male above, of a most beautiful azure or shining silvery blue, changing as the scite varies to lilac, at the posterior margin edged with black. Female above, brown with a black dot on a blueish disk; secondary wings with tawny and black spots, at the posterior margin underneath greyish; in the male rather cinereous; both sexes in other respects as in *P. Corydon*, but with the spots more distinctly ocellated and the discoidal white spot is smaller, merely a transverse streak. Fringe on both sides, white barred with brown.

*Caterpillar.* Green, with dorsal rows of tawny spots.

*Chrysalis.* Green, or brown.

*Observation.* *P. Adonis*, being by far the most lovely of the British Blues, is much sought after by our inferior collectors, who make annual and distant pedestrian excursions for the sole purpose of procuring its charming males, to decorate their pictures with; a picture consisting of numerous and beautiful Lepidoptera, ornamenteally and regularly disposed, being the ultimate object of these assiduous people in the science of Entomology. These pictures are of various shapes and sizes. I have seen some which have contained 500 specimens.\*

• Haworth.

## POLYOMMATUS DORYLAS,\* COMMON BLUE.

*Lewin, pl. 38, f. 4, 5, 8.*

*Butterfly.* Male above, of a bright lilac blue, or as it were silky, with a posterior margin, black anterior and fringe white. Female wings above, brown, with a disk more or less blue, also sometimes entirely brown, with a band at the posterior margin of orange subocellated spots, common to both wings; underneath the wings are of a deep ash-colour or drab. Fringe barred with brown. Underneath, in both sexes, nearly the same as in the two preceding species, (viz. *P. Corydon* and *P. Adonis*), but the central white spot in the disk of the secondary wings has an indistinct pupil.

*Caterpillar.* Hairy, bright green, with a dark dorsal line, and triangular yellow lateral spots adjoining.

*Chrysalis.* Dark brown.

## POLYOMMATUS ARGUS, SILVER-STUDDED BLUE.

*Lewin pl. 39, f. 5, 6, 7. Donovan v. 4, p. 143. Duncan pl. 33, fig. 3.*

*Butterfly.* Male. Wings above, blue with a tint of lilac, posterior margin and veins black and broader than in *P. Dorylas*, anterior margin and fringe white; underneath bluish, especially at the base. Primary with six black discoidal ocellated spots, the three intermediate ones are oblong with the posterior pair inclined towards each other, the others round; a double band of black spots at the posterior margin, with a faint tawny band often between them. Posterior margin of the secondary wings underneath, with an articulate orange-tawny band, containing six silvery blue spots, and crowned by a series of black crescents; sometimes

\* Quære. Is this *P. Ateles* of Stephens' list?

only the interior spots have a few blue scales upon them, the rest being black. Female above, entirely brown, with a marginal orange-tawny band, obsolete in the primary. Underneath greyish; a dentated white band traverses both wings. Fringe brown.

*Caterpillar.* Green, hairy, beset with white tubercles, with a reddish brown white-edged dorsal and lateral stripe, and oblique streaks of the same colour in the sides. Head and true legs are black-brown.

*Chrysalis.* At first green, then bright brown.

#### POLYOMMATUS IDAS, BROWN ARGUS.

*Lewin, pl. 39, f. 1, 2. Donovan, v. 9, p. 322.*

*Butterfly.* Smaller than the preceding ones; wings above in both sexes, without any of the blue tint, (in which it remarkably differs from those related to it) with a black spot on the disk of the primary, and with an orange macular band at the posterior margin of both wings; fringe and anterior margin of primary wings white. Underneath brownish ash-coloured, with ocellated spots and crescents, and orange band, nearly as in the preceding, but sometimes without the silvery blue spots in the orange band. There is a white discoidal blotch towards the margin of the secondary wings underneath. Female differs a little from the male, in being deeper coloured, and rather more dusky, the red spots being smaller and not reaching the anterior margin.

*Caterpillar.*

*Chrysalis.*

*Observation.* This is sufficiently distinguished from the female of *P. Argus*, by being without the dentated white band, and having a white blotch near the posterior margin of the underside of the secondary wings.

## POLYOMMATUS ARTAXERXES, SCOTCH ARGUS.

*Lewin* pl. 39. f. 8, 9. *Donovan* v. 16, p. 541. *Duncan* pl. 34, fig. 4.

*Butterfly.* Wings above, black brown, underneath pale drab: fringe white. Primary above, with a discoidal white dot; underneath with a white discoidal, and five other white spots between it and the posterior margin. Secondary wings above, with five marginal subocellated spots, iris interiorly broad and orange, posteriorly slender and pale, pupil black; underneath with white scattered spots, and a large white blotch near the margin. Both wings like the preceding species have an orange-coloured band, terminating interiorly in a series of black and white crescents, and posteriorly in a white spot, with a black pupil. Knob of the antennæ white underneath and at the tip.

*Caterpillar.*

*Chrysalis.*

*Observation.* The only known locality of this insect for a long period was Arthur's-seat, Edinburgh; but of late it has been found elsewhere.

## POLYOMMATUS ARGIOLUS, AZURE BLUE.

*Lewin* pl. 36. f. 4, 5, 6. *Donovan* v. 14, p. 481. *Duncan* pl. 31, fig. 1.

*Butterfly.* Wings above, shining with a lilac tint, underneath French grey. Primary above, with a blackish posterior margin fringe black and white; underneath with a band formed of five slender transverse black streaks, next that the anterior margin forming an angle with the rest; fringe white; secondary with a white fringe above, with the posterior margin terminating in a slender black line; under-

neath, with eleven or twelve scattered black dots. The other sex is smaller and rather pale above, and the upper surface of the wings is brownish black, with the disk up to the base blue, but paler; in the secondary at the posterior margin there are four obsolete spots, which have also the black dots underneath that are nearest the posterior margin more orderly arranged.

*Caterpillar.* Hairy, yellowish green, with a bright green dorsal line; head and legs are black.

*Chrysalis.* Smooth, brown and green, with a black dorsal line.

#### POLYOMMATUS CYMON, MAZARINE BLUE.

*Lewin, pl. 38, fig. 6, 7.*

*Butterfly.* Female wings above, entirely black, with brown hairs, and a few blue scales intermixed towards the base; fringe white. All the wings of the male above, very deep blue, with black posterior margin and veins, and white fringe, and underneath rather ash-coloured, blueish at the base. The secondary only of the female blueish at the base. Primary wings in both sexes underneath, with an oblong discoidal spot cinctured with white, with a band of eyelets below the centre, seven in the male and four or five in the female. Secondary wings underneath, with a single basal dot near the costal margin, and a narrow discoidal streak, especially in the female, with an undulated and interrupted band below the middle in the male, consisting of eight spots, all with a black pupil and white iris; and in the female, besides the discoidal spot, five eyelets with black pupil and white iris, one in a line with the streak and near the costal margin, and four arranged in a transverse band towards the posterior margin.

*Caterpillar.*

*Chrysalis.*

### POLYOMMATUS ALSUS, SMALL BLUE.

*Lewin, pl. 39, f. 3, 4. Duncan, pl. 31, fig. 3.*

*Butterfly.* All the wings above, brown, with a few blue scales at the base. Primary underneath, ash-coloured, with a lunulated discoidal spot cinctured with whitish, and from six to seven posterior ocellated dots, also cinctured with white in a transverse band. Secondary underneath, with a single discoidal streak nearer the costal margin, and about eight ocellated black dots, two near the base, and six forming a band near the posterior margin. Female smaller and more obscure, otherwise like.

*Caterpillar.*

*Chrysalis.*

*Observation.* This delicate little Butterfly is the smallest of the British *Polyommati*, and though pretty generally scattered throughout the kingdom, is no where very abundant.

### POLYOMMATUS THESTYLIS.

*Butterfly.* Wings above, black with a deep blue disk, anterior margin with a slender white edge; underneath of a pale drab or brown ash-colour, terminating in a slender black line at the edge, at the base somewhat glaucous or blueish green; fringe long and white, with shorter brown scales intermixed. Primary wings above, with a transverse discoidal black spot near the anterior margin, underneath with a discoidal wreath consisting of ten ocellated spots, black cinctured with white, of which the discoidal one is

triangular; at the margin is the usual articulate band of six ocellated spots consisting of a black pupil, iris white posteriorly, interiorly orange, crowned with a black and white acute vertex. (N. B.—There is a faint trace of this band on the upper side of the wing.) Secondary wings on both sides of the margin with a similar band, the upper one consisting of six, and the lower one of eight spots, in the latter, the first and last spot have no pupil, and the last but one is formed of two spots and has two pupils; in the disk of the underside is a triangular wreath consisting of eleven ocellated spots, in the centre of which is a discoidal triangular one, all black cinctured with white. A white blot connects the wreath with the marginal band.

*Variety 1.* The primary wings have a distinct marginal band of orange-coloured crescents, surmounted with black, and the central spot of the underside of the secondary is blind.

*Variety 2.* Like the preceding, but in the band of the upper side of the secondary wings the posterior part of the iris is silvery. *Kirby.*

Taken near Ipswich, in June, 1827.

*Caterpillar.*

*Chrysalis.*

#### POLYOMMATUS LACON.

*Butterfly.* Very like *P. Thesyllis*, but the fringe of the secondary wings is barred with brown. Primary wings underneath have a rather large kidney-shaped blackish spot cinctured obscurely with white, the concave side of which is towards the interior margin; the discoidal circlet consists only of eight ocellated spots, including these, arranged obliquely as it were in two bands. The secondary wings

underneath are darker, and blacker at the base, the triangular wreath consists of only ten spots, of which that next the costal margin is kidney-shaped, with the concave side towards the disk.

N. B.—In one wing the pupil of the kidney-shaped spot is double or interrupted in the middle. *Kirby.*

*Caterpillar.*

*Chrysalis.*

#### POLYOMMATUS CALÆTHIS.

*Butterfly.* Very like the two preceding species. Fringe barred with black. Secondary wings underneath, with a discoidal white cinctured crescent, below which towards the posterior margin is an undulated band consisting of seven ocellated spots. *Kirby.*

*Caterpillar.*

*Chrysalis.*

*Observation.* The above three species are all related to *P. Argus*, *Idas*, &c. but appear distinct.

*Genus HESPERIA*, pl. III. fig. 15.

#### \* H. COMMA.

*Antennæ* short; knob rather abrupt, but growing gradually thicker, ending in a hooked point; joints less than thirty.

*Palpi* rather longer than the head, very hairy.

*Legs* long; *forelegs* perfect; *cubit* short, with a broadish oblong spur a little below the tip.

*Claws* very short bifid, or double; *foot cushions* large, filling the space between the claws.

*Wings* intire; *primary* triangular and nearly wedge-shaped; *secondary* between triangular and rounded, with a projection at the costal margin near the base.

## \* \* II. TAGES.

*Antennæ* knob tapering both ways, curved ; joints more than thirty.

In other respects like the preceding.

## \* \* \* II. LINEA.

*Antennæ* thickening from beyond the middle into a long obtuse straight knob ; joints less than thirty.

*Egg* unknown.

*Caterpillar* naked, or pubescent, fusiform (a.)

*Chrysalis* inclosed in a cocoon, head-case rounded notched.

*Reaum.* i. pl. xi. fig. 6—12.

*Hübner Schmet.* pl. xcv. E.

## HESPERIA COMMA, PALE SPOTTED SKIPPER.

*Lewin*, pl. 46, fig. 1, 2, 3.

*Butterfly.* Wings tawny, darker towards the tips, with a brown posterior margin and whitish long fringe, which underneath is tawny ; primary with a discoidal oblique black blotch, an undulated band on both sides of paler square spots ; underneath paler, at the internal part of the base, brown, greenish at the tips ; secondary on both sides with six quadrangular spots, emarginate posteriorly, one placed towards the base, the other five arranged in a curved band nearer the posterior margin, which forms a crescent in the disk of the wing ; underneath paler with a greenish hue. The female is larger without the black blotch, paler underneath, with spots less distinct.

N. B.—This is probably the *H. Sylvanus* of Mr. Haworth, but it appears to be the *H. Comma* of Linnaeus, and many other authors.

*Caterpillar.* Dirty green, with a dorsal and lateral row of black dots mixed with red. The head is black, with a white collar.

*Chrysalis.* Elongated and cylindrical.

#### HESPERIA SYLVANUS, LARGE SKIPPER.

*Lewin, pl. 45, fig, 1, 2.*

*Butterfly.* Wings brown, with tawny spots and blotches; above the posterior margin blackish. Fringe pale. Primary on both sides with an undulated band of square pale spots emarginate posteriorly, the five next the tip whiter than the rest; underneath base interiorly brown, the rest of the wings tawny, spots paler than those above. Secondary projecting near the anal angle into a tooth, with five quadrangular posteriorly emarginate pale spots, one towards the base, and the other four forming an angular abbreviated band below the centre of the wing, underneath paler and greenish, with nine quadrangular posteriorly emarginate white spots, viz. three at the base arranged in a triangle, and six discoidal, forming an acute-angled open figure.

*Caterpillar.*

*Chrysalis.*

*Observation.* This appears to be the *H. Comma* of Mr. Haworth, but it agrees best with the description of *H. Sylvanus* of Fabricius. When it alights, which it does very often, for it is never long on the wing, it always turns half-way round, so that if it settles with its head from you, it turns it towards you.

#### HESPERIA PANISCUS, CHEQUERED SKIPPER.

*Donovan, v. 8, pl. 254.*

*Butterfly.* All the wings above, black, spotted with tawny. Primary with a central blotch, then as it were a

band interrupted below the centre, intersected only with black veins, behind this two smaller posterior spots, and lastly, a marginal band of tawny dots. Secondary wings black, with three discoidal spots, and a row of four dots towards the posterior margin, all tawny. Primary underneath, yellowish, with three discoidal spots, then four smaller posterior ones, and the veins at the posterior margin rather brown. Secondary yellowish, or rarely greyish, with brown veins and seven larger spots of the disk, and five smaller, forming a posterior band, all inclining to white. Antennæ pale underneath.

*Caterpillar.* On the back dark brown, with the sides paler, with two yellow longitudinal stripes, black head, and an orange-coloured ring round the neck.

*Chrysalis.*

#### HESPERIA LINEA, SMALL SKIPPER.

*Lewin, pl. 45, f. 1, 2.*

*Butterfly.* Of a smaller size than *H. Sylvanus*, wings above tawny-orange with spots, with veins and margins black: fringe pale. Primary underneath, paler, brown at the base internally. Secondary tawny ash-colour, with a large tawny spot at the anal angle. Male differs from the female in having an oblique black line in the centre of the primary wings.

*Caterpillar.* Solitary, green, with dark dorsal and lateral lines.

*Chrysalis.* Yellowish green.

#### HESPERIA TAGES, DINGY SKIPPER.

*Lewin, pl. 45, f. 3, 4.*

*Butterfly.* Size of *H. Comma*. All the wings above brown, obsoletely clouded with grey, with usually obsolete scattered

white dots on both sides, with a marginal series of white dots. Underneath between tawny and cinereous, with all the dots very obscure. Male on both sides more obscure than in the female, as in the three foregoing ones, and without the oblique black line on the primary wings.

*Caterpillar.* Bright green, with a brown head, and yellow dorsal, and lateral stripes dotted with black.

*Chrysalis.* Anterior part is dull green and posterior reddish.

HESPERIA MALVÆ, MALLOW OR GRIZZLED  
SKIPPER.

*Lewin, pl. 46, f. 8, 9.*

*Butterfly.* Above black, sometimes blackish, with numerous white quadrangular scattered spots on both sides; fringe white, barred with black. Primary wings underneath, with larger spots, but not so white. Secondary greyish, with whitish veins.

*Caterpillar.* Greyish, head black, dotted on the neck with four brimstone-coloured dots.

*Chrysalis.* Blueish.

HESPERIA LAVATERÆ, SCARCE GRIZZLED  
SKIPPER.

*Lewin, pl. 46, f. 4, 5.*

*Butterfly.* Scarcely distinct from the preceding, but smaller; it differs principally in an oblong white blotch on both sides in the centre of the primary wings towards the interior margin, which sometimes it doubled by the confluence of two contiguous spots. All the white spots are more oblong and larger than in *H. Malvæ*; secondary wings underneath, greyish, with whitish hairs.

*Caterpillar.*

*Chrysalis.*

ASCERTAINED BRITISH SPECIES,  
*ACCORDING TO MR. STEPHENS.*

COLIAS EUROPOME. *Esper?*

*Duncan, pl. 6, fig. 2.*

*Butterfly.* Wings above, sulphur-coloured, the posterior margin with a broad black border. Primary with a discoidal black spot nearer the anterior margin on both sides, but underneath subocellated. Secondary above, with a tawny spot scarcely discernible, underneath with a sesquialterous eyelet, iris tawny, pupil silvery; a series of brownish dots arranged transversely near the posterior margin of both wings. Female with six yellow spots in the black margin of the primary wings, the posterior margin of the secondary less conspicuously black, with the black border dentated.

*Caterpillar.*

*Chrysalis.*

PONTIA NELO.

*Butterfly.*

*Caterpillar.*

*Chrysalis.*

PONTIA NAPEÆ.

*Butterfly.* Wings very intire of a milky white; primary

above, with a spot, and the tips black; secondary pale, with the three principal veins dilated green.

*Caterpillar.*

*Chrysalis.*

#### MELITÆA PYRONIA.

*Butterfly.*

*Caterpillar.*

*Chrysalis.*

#### HIPPARCHIA MNESTRA.

*Butterfly.* Wings rounded, black brown, primary above, with a wide red band, with two black dots (female on both sides with two cyclets) underneath with the disk red without dots; secondary above, with an abbreviated red band (female with three minute cyclets,) underneath without spots, with an obliterated band before the posterior margin.

*Caterpillar.*

*Chrysalis.*

#### HIPPARCHIA IPIIS.

*Butterfly.* Wings very intire, above brown; secondary underneath grey with an interrupted white band, and six eyelets with a white pupil.

*Caterpillar.* Dark green, with a bluish head, with a slender dark dorsal stripe.

*Chrysalis.* Dark green.

#### HIPPARCHIA ARCANIUS.

*Butterfly.* Wings very intire, ferruginous; primary underneath with a single eyelet; the secondary with five, the first being remote, with a white band.

*Caterpillar.* Green, with a red mouth. Dorsal line dark green, on each side is a whitish yellow line, and over the legs a yellow one.

*Chrysalis.*

#### THECLA SPINI.

*Butterfly.* Wings tailed, brown above, underneath ash-coloured, with tawny marginal crescents and a blueish anal spot.

*Caterpillar.* Green, somewhat reddish, with a black head, with yellow dorsal lines.

*Chrysalis.* Brown.

#### POLYOMMATUS ACIS.

*Duncan, pl. 31, fig. 4.*

*Butterfly.* Wings intire, above blue with a black margin; underneath ash-coloured with a band of ocellated dots.

*Caterpillar.*

*Chrysalis.*

#### POLYOMMATUS AGESTIS.

*Duncan, pl. 34, fig. 1.*

*Butterfly.* Wings intire brown, on both sides, with a red macular band; fringe variegated with black and brown. Underneath hoary, with numerous ocellated dots.

*Caterpillar.*

*Chrysalis.*

#### POLYOMMATUS ALEXIS.

*Duncan—vignette in title.*

*Butterfly.* Wings intire above, blue without spots, with a white fringe; underneath inclining to ash-colour, with

numerous ocellated spots, and a marginal macular tawny band.

*Caterpillar.* Green, hairy, with a dark dorsal line.

*Chrysalis.* Dark brown.

#### POLYOMMATUS ALCON.

*Duncan, pl. 32, fig. 2.*

*Butterfly.* Wings intire, blue, with a brown margin; underneath brown ash-coloured, with a double series of ocellated dots.

*Caterpillar.*

*Chrysalis.*

#### POLYOMMATUS EROS.

*Butterfly.* Wings above, azure blue, without spots; underneath ash-coloured, with numerous ocellated dots; secondary with an obliterated yellow marginal band.

*Caterpillar.*

*Chrysalis.*

#### POLYOMMATUS ICARIUS.

*Butterfly.* Wings intire, blue with a black margin; underneath ash-coloured, with an arched series of ocellated dots, and of marginal tawny spots.

*Caterpillar.*

*Chrysalis.*

## DOUBTFUL BRITISH SPECIES,

*ACCORDING TO MR. STEPHENS.*

## COLIAS PALÆNO.

*Butterfly.* Wings of the male citron yellow ; of the female whitish. Posterior margin black, sometimes dusted with yellow, and sometimes with white. At the anterior margin in the middle is a black, and in the secondary wings a whitish spot. The edge is rose-coloured. The primary wings are underneath in the male yellow, in the middle dusted with black, with the posterior margin greenish ; those of the female are whitish ; the anterior margin deep yellow, a whitish rhomboidal spot edged with black in the middle. The secondary wings are deep yellow, sprinkled with blackish atoms, and there is a silver spot cinctured with brownish red.

*Caterpillar.*

*Chrysalis.*

*Observation.* The above is the description of *C. Palæno* in Ochsenheimer's *Schmetterlinge von Europa*, vol. ii. p. 185, who regards *Papilio Europome* of Esper as synonymous with it. As Mr. Haworth took his description of *C. Europome* not from the specimens in the collections of Messrs. Franchon and Swainson, which he refers to, but from a German one, it seems not quite certain whether that was synonymous

with the English ones, which doubt is increased by Mr. Stephens' description and figure, which does not altogether agree with Mr. Haworth's description; who says of the primary wings, that underneath they are whitish. From the rose-coloured edge or fringe of the wings in *C. Palæno*, as described by Ochsenheimer, which Mr. Stephens has also observed in *C. Europome*, there seems some reason for thinking them synonymous; but as the female differs very materially (see the descriptions), Mr. Stephens appears justified in considering them as distinct.

N. B.—The note in p. 36, was inserted by some mistake.

#### DORITIS APOLLO.

*Duncan*, pl. 11, fig. 1.

*Butterfly*. Wings very intire, rounded, white dusted with black, subtransparent; primary with five black spots; secondary above, with two, underneath with three blood-red eyes cinctured with black, with a white pupil, spotted also with red.

*Caterpillar*. Tuberculated, with a Y-shaped scent organ issuing from the neck; of a velvety black with a double lateral series of reddish orange spots.

*Chrysalis*. Rounded, black, covered except at the sutures with a pearl-coloured bloom.

#### DORITIS MNEMOSYNE.

*Butterfly*. Wings oblong, intire, subtransparent, white with black nervures; primary with two black marginal spots; secondary powdered thickly with black at the interior margin, which blackness towards the anal angle sends inward two branches.

*Caterpillar.*

*Chrysalis.*

### MELITÆA DIA.

*Butterfly.* Wings rather indented, tawny, spotted with black; secondary underneath purple, spotted with yellow and silver, with a series of brown subocellated dots.

*Caterpillar.* Black, clearer over the back, with a black dorsal line, and whitish spines.

*Chrysalis.*

### MELITÆA MATURNA.

*Butterfly.* Wings rather indented, brown, banded with tawny and yellow; secondary tawny underneath, with three yellow bands.

*Caterpillar.* Head, body, and spines are black, over the back and on each side is a large brimstone dotted stripe. The dorsal stripe is divided by a black line.

*Chrysalis.* Greenish white, spotted with yellow and black; with seven rows of yellow tubercles posteriorly.

### ARGYNNIS NIOBE.

*Butterfly.* Wings indented, yellow, spotted with black, and black at the base; secondary underneath variegated with ferruginous, with silver (or yellow) spots, and ferruginous eyelets with silver pupils.

*Caterpillar.* Brownish, with orange-brown head and legs, a white dorsal stripe powdered with black, between which and the black lateral stripe is a whitish triangular spot.

*Chrysalis.*

## VANESSA LEVANA.

*Butterfly.* Wings indented, variegated, reticulated underneath; primary above, with some white spots.

*Caterpillar.*

*Chrysalis.*

## LIMENITIS POPULI.

*Butterfly.* Wings indented, brown, banded and spotted with white; underneath yellow, banded with white, with blueish spots.

*Caterpillar.*

*Chrysalis.*

## LIMENITIS SIBILLA.

*Butterfly.* Wings indented, brown, underneath ferruginous with a double row of marginal black dots; with a white macular band on both sides.

*Caterpillar.* Head heart-shaped red, with two white stripes. Body yellowish green, with white hairs and red spines, and a white lateral stripe.

*Chrysalis.* Green, with some silver dots on the head and breast.

## HIPPARCHIA PHÆDRA.

*Butterfly.* Wings indented, brown; primary with two black eyelets with blue pupils.

*Caterpillar.* Ash-coloured, with two rows of black longish spots over the back.

*Chrysalis.*

## HIPPARCHIA MÆRA.

*Butterfly.* Wings indented, brown ; primary on both sides, with an eyelet with a smaller near it ; secondary above, with three eyelets, below with six.

*Caterpillar.* Bright green, with a whitish lateral stripe, a darkish dorsal line, and fine whitish hairs.

*Chrysalis.* Blackish, or black-green.

## POLYOMMATUS TITUS.

*Butterfly.* All the wings above, brown, without spots, underneath also they are brown ; the primary with a posterior band consisting of white and black lines ; secondary with a discoidal narrow spot, and a band consisting of black spots cinctured with white. Towards the margin there are red spots, marked with a black dot.

*Caterpillar.*

*Chrysalis.*

ASCERTAINED BRITISH SPECIES,  
*ACCORDING TO MR. DUNCAN.*

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PONTIA CHARICLEA.—*pl. 8. fig. 1.*

This insect is less than *P. Brassicæ*. The anterior wings with light brown patch at the tip, clouded internally with black, fringe yellowish white: underside tip of primary wings yellow; secondary pair entirely deep yellow, with minute black points.

PONTIA METRA.—*pl. 8. fig. 2.*

The wings of this insect expand from 20 to 25 lines. The colour is entirely yellowish white, base of the wings blackish, tip of the anterior light brown; in the male, a single obsolete dusky spot, in the female two. The hinder wings are wholly white, with the usual dusky spot anteriorly, tip of upper wings yellow beneath two faint spots on the disk, hinder wings bright yellow beneath, with black points, fringe pure white.

PONTIA SABELLICÆ.—*pl. 8. fig. 3.*

Upper wings short and rounded, yellowish white; base anterior margin and tip black, nervures with a broad stripe of the same colour; male a single dusky spot near the tip, the female two. Underside hinder wings and tip of the anterior sulphur yellow, nervures dusky.

PARNASSIUS APOLLO.—*pl. 11. fig. 1.*

This appears to be the *Doritis Apollo*, described among the doubtful species of Mr. Stephens—see p. 131.

MELITÆA ATHALIA.—*pl. 12. fig. 2.*

This is the *Dictynna* of Lewin—see *pl. 14. f. 5, 6.*

HIPPARCHIA CASSIOPE.—*pl. 24. fig. 3.*

The wings of this species expand about 16 lines. The colour is dark brown, with a silky gloss; upper ones with a red interrupted band towards the apex, marked with a row of from three to five black spots; short band of hinder wings consists of a few continuous red marks, each bearing a small black spot; underside of the anterior differ only in being more or less tinged with rust-red, hinder wings ash-brown beneath, with three black spots surrounded by a reddish iris, fringe brown. Antennæ black above, white below.

THECLA W. ALBUM.—*pl. 28, fig. 2.*

This appears to be *T. Pruni* of Lewin—see *pl. 44, f. 1, 2,* but is probably a variety of that species.

LYCÆNA DISPAR.—*pl. 29, fig. 1, 2.*

This is the *L. Hippothoë* of Linnaeus.

LYCÆNA HIPPOTHOË.—*pl. 30. fig. 2.*

Expansion of wings from 15 to 17 lines. The colour of the surface bright fulvous, with narrow external black border, entire in the primary, but crenated internally in the secondary, with a transverse black mark in the middle of each wing; the superior wings are yellowish beneath, with black

spots cinctured with white; inferior ash-coloured, with ocellated dots, and posterior fulvous band spotted on each side with black.

**POLYOMMATUS ACIS.**—*pl. 31, fig. 4.*

This is *P. Cymon* of Lewin—see *pl. 38, f. 6, 7.*

**POLYOMMATUS ALCON.**—*pl. 32, fig. 2.*

Wings of male violet-blue, with brown border, and a dark crescent on the disk of the upper pair; female dusky brown, tinged with blue towards the body; underside in both sexes greyish, with central crescent spot, bordered with white on each wing, behind this a curved row of black spots and two rows of triangular marks, circled with white; base of hinder wings tinged with blue, spotted like the superior, fringe white, spotted with brown.

**POLYOMMATUS AGESTIS.**—*pl. 34, fig. 1.*

This is *P. Idas* of Lewin—see *pl. 39, f. 1, 2.*

**POLYOMMATUS SALMACIS.**—*pl. 34, fig. 2.*

Silky brown above, with macular posterior band of orange-red on all the wings, white spot occasionally on the disk of primary, fringe white and brown at the base; underside greyish brown; anterior with a white spot, beyond this a curved band of similar spots, with dusky pupil, succeeded by a band of orange spots, bounded on both sides by a dusky crescent, surmounted with white, outer margin defined by a dusky line; hinder wings have a similar band, with white spots towards the base, a larger one near the centre, and very irregular row behind the middle, with a broad white central patch connecting it with the yellow band; most of these spots have a minute dusky pupil.

## GLOSSARY OF TERMS

USED IN THE DESCRIPTION OF BUTTERFLIES.

<i>Cinereous</i> .....	white with a shade of brown.
<i>Griseous</i> .....	white mottled with black.
<i>Flavus</i> .....	pure yellow.
<i>Sulphureous</i> .....	yellow with a tint of green, brimstone.
<i>Luteous</i> .....	deep yellow with a tint of red.
<i>Orange</i> .....	equal parts of red and yellow. Example, the apex wings of <i>P. Cardamines</i> .
<i>Fulgid</i> .....	a bright fiery red. Ex. <i>L. Dispar</i> .
<i>Lilac</i> .....	colour of the flower of lilac. Ex. part of the iris of the ocellus in the wings of <i>F. Io</i> .
<i>Ceruleus</i> .....	sky blue. Ex. <i>P. Adonis</i> .
<i>Cæsious</i> .....	very pale blue with a little shade of black. Ex. underside of the wings of <i>P. Argiulus</i> .
<i>Tawny</i> .....	a pale dirty orange. Ex. wings of <i>H.</i> <i>Pamphilus</i> .
<i>Fuscous</i> .....	a dull brown. Ex. <i>H. Semele</i> .
<i>Argent</i> .....	silver. Ex. the spots in the under wings of <i>A. Lathonia</i> .

<i>Eyelet</i> .....	a spot of a different colour included in the <i>plaga</i> or <i>macula</i> . Ex. the ocelli in primary wings of <i>H. Semele</i> .
<i>Venose</i> .....	with lines or veins. Ex. underside of wings of <i>P. Napi</i> .
<i>Inscribed</i> .....	when the surface is marked with the resemblance of any letter. Ex. <i>V. C. Album</i> .
<i>Lunulet</i> .....	a small crescent-shaped spot. Ex. marginal spots above and below secondary wings of <i>A. Artemis</i> .
<i>Ocellus</i> .....	an eye-like spot in the wings of many <i>Lepidoptera</i> , consisting of annuli of different colours inclosing a central pupil.
<i>Pupil</i> .....	the central spot of ocelli. An ocellus is called bipupillate or tripupillate when there are two or three of these spots. Ex. primary of <i>H. Pilosellæ</i> .
<i>Suffused Pupil</i> ...	when the pupil shades into another colour. Ex. primary wing of <i>V. Io</i> .
<i>Iris</i> .....	the circle which incloses the pupil.
<i>Simple Ocellus</i> ...	when the ocellus consists only of iris and pupil.
<i>Twin Ocellus</i> .....	when such ocelli join each other. Ex. the underside of primary wing of <i>H. Hyperanthus</i> .
<i>Marmorate</i> .....	streaked, veined, and clouded like marble. Ex. underside of wings in <i>V. Io</i> .
<i>Fuscia</i> .....	a broad transverse band.
<i>Pyramidalate Fuscia</i>	a band with an angle on one side. Ex. the wing of <i>A. Iris</i> and <i>A. Paphia</i> .

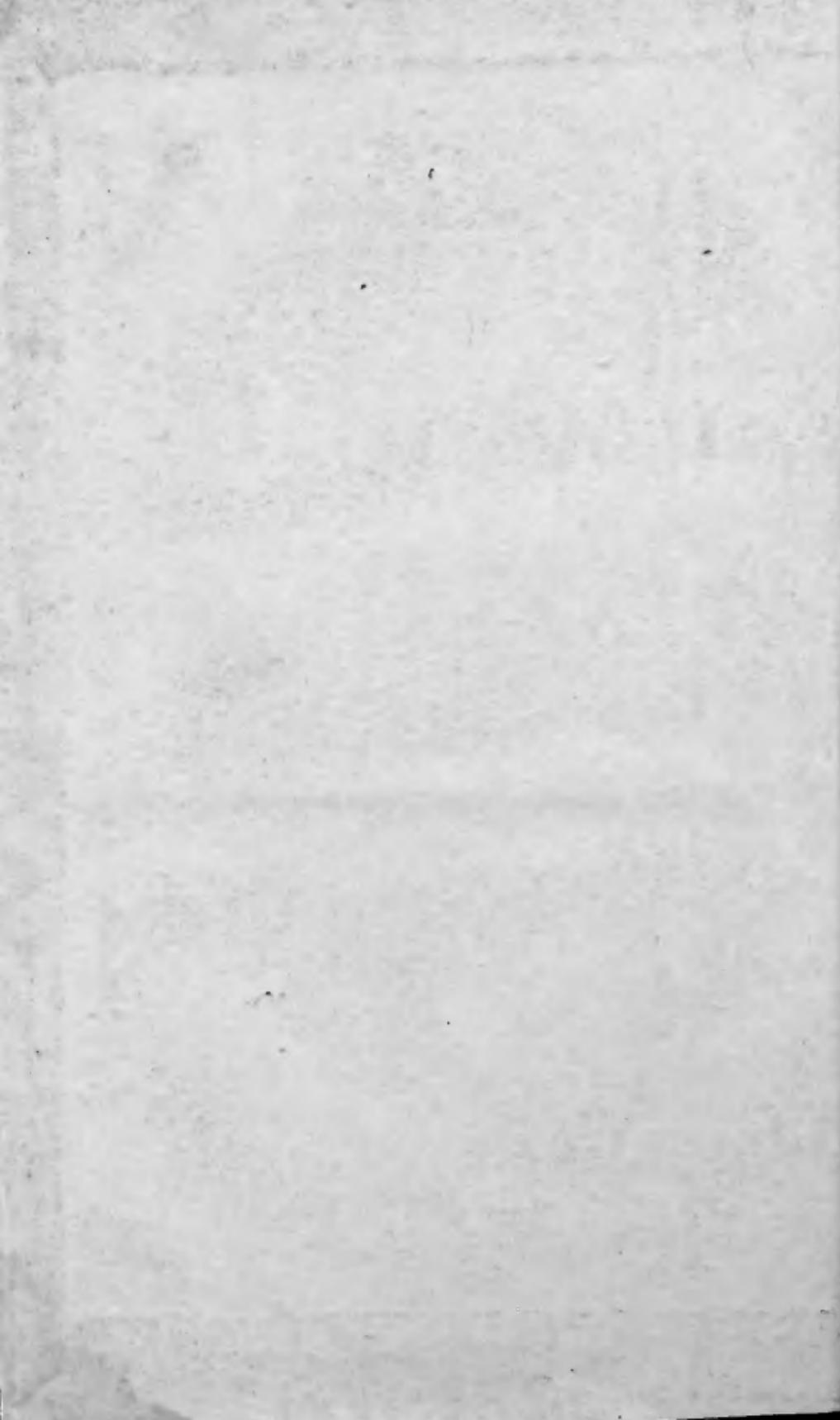
<i>Distinct</i> .....	when the spots do not touch each other. Ex. wings underside of <i>L. Dispar</i> .
<i>Contiguous</i> .....	when the spots nearly touch each other. Ex. the margin of the wings in <i>A. Aglaia</i> .
<i>Confluent</i> .....	when the spots run into each other. Ex. underside of the wings of <i>P. Daplidice</i> .
<i>Obsolete</i> .....	when a spot is scarcely visible.
<i>Undulate</i> .....	when the surface rises or falls obtusely. Ex. margin of the wings of <i>H. Semele</i> .
<i>Erose</i> .....	small irregular notches as if knawed. Ex. wings of <i>V. C. Album</i> .
<i>Dentate</i> .....	cut into teeth.
<i>Divaricate</i> .....	when the wings diverge from each other.
<i>Caudate</i> .....	when the wings terminate in a tail-like process. Ex. <i>P. Machaon</i> .

## F I N I S.

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